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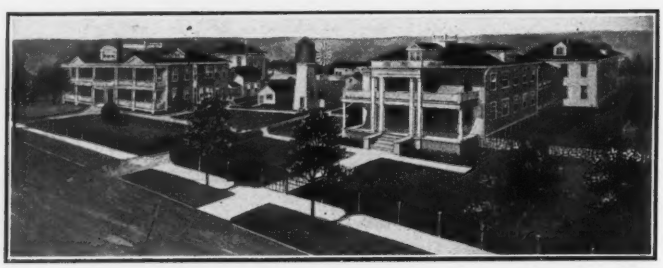

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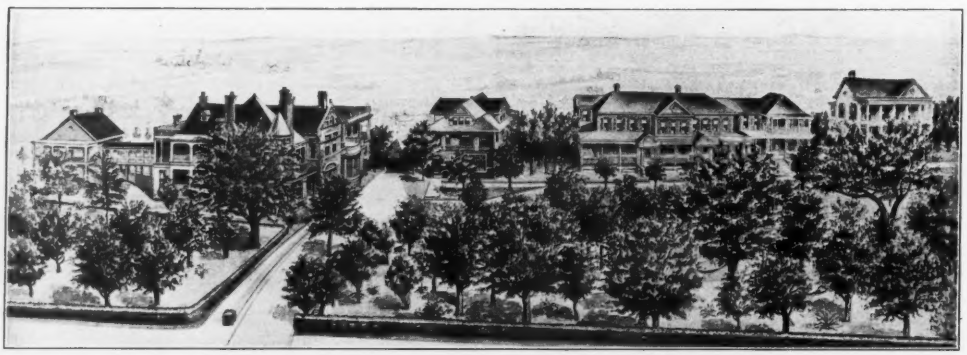

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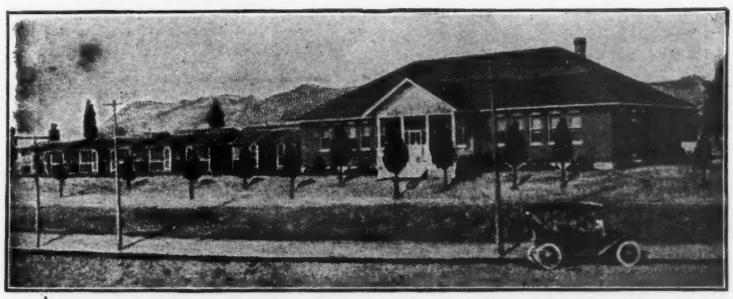

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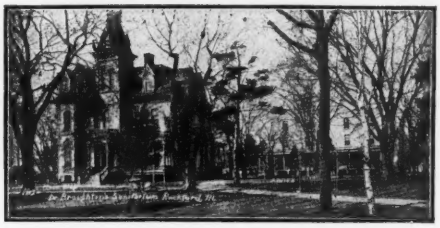

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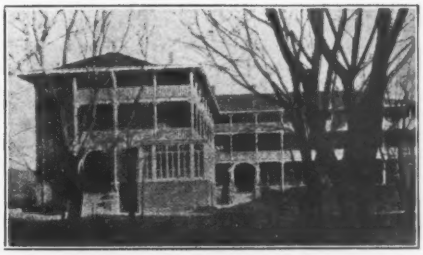

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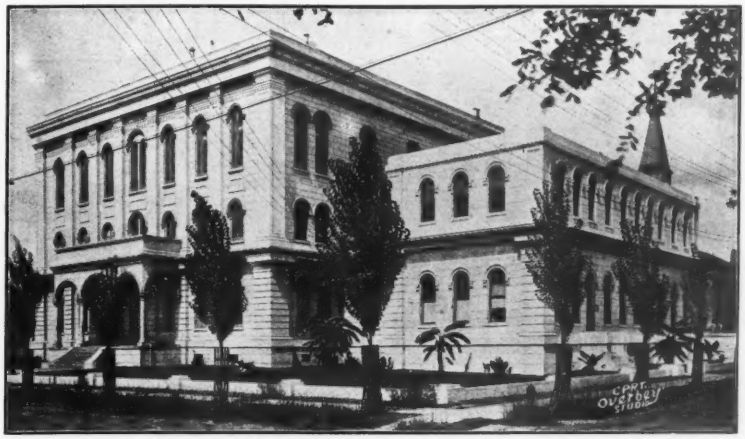

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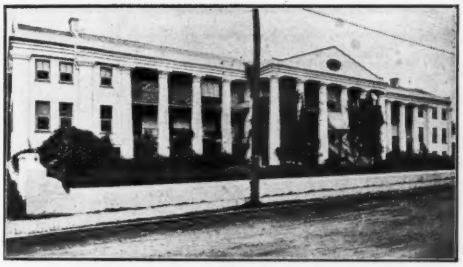

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MEDICINE

(INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

THE GLYCOSURIAS.

By James S. McLester, M.D.,
Professor of Medicine, Graduate School of Medicine, University of Alabama, and Physician-in-Chief to the Hillman Hospital, Birmingham, Ala.

Gentlemen of the Southern Medical Association: I wish to express my sincere appreciation of the honor conferred upon me in being asked to address such a learned and representative body of men as are included in this Association. I have chosen for my theme not a disease, but a symptom —glycosuria—the subject of more investigation and more controversy perhaps than any other single disease condition. At the same time it must be kept clearly in mind that glycosuria is a symptom and not a disease, since failure in the past to distinguish properly between glycosuria and diabetes has been the occasion of much confusion and useless investigation.

In discussing in a limited space a subject about which so much is known, and yet so little is certain, brevity demands that one speak with a degree of positiveness, which I trust you will pardon.

Any discussion of the glycosurias or attempts to classify them should include a consideration of what is known as the paradoxical law. This law concerns itself with the assimilation limits of sugars; to quote the words of Allen, "If with a given dose any utilization of carbohydrate occurs at all, an increase of the dose causes the utilization of a larger quantity."

In all glycosurias, except one, the limit to the ability of the tissues to utilize sugar is relative, not absolute. Should dextrose be given an individual already glycosuric, not all of this added sugar serves to augment the glycosuria, for at least a part is utilized by the tissues, and if he is given still further sugar, even more is consumed by the tissues, and yet more if more is added. At no time does the increment of glycosuria account fully for the additional sugar administered, whether this be by mouth or subcutaneously. Diabetic glycosuria offers the only exception to this law.

Thus, fully developed diabetes mellitus is distinguished by an absolute limit of sugar tolerance. If the patient with diabetes is already glycosuric, he responds to the admnistration of additional dextrose by an equal and frequently surpassing glucose increment in the urine.

And in still another way the diabetic organism shows its peculiar inability to handle sugars. To the diabetic, sugar is a diuretic, while to others it is anti-diuretic. This

*Oration on Medicine, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas, November 8-11, 1915.

may be explained upon the hypothesis that sugar ordinarily circulates in chemical combination with some other substance which makes of it a colloid, and, according to the law of colloids, an anti-diuretic. In the diabetic, however, sugar is permitted no such combination and must circulate in its crystalline state, exerting the diuretic influence of crystalloids.

To distinguish clearly between diabetes mellitus and other conditions accompanied by glycosuria, I should define diabetes as a progressive disease of carbohydrate metabolism, characterized by hyperglycemia, by a form of glycosuria which fails to obey the paradoxical law and by the profuse diuresis which follows the administration of dextrose.

With this understanding, I have divided the glycosurias into diabetic and non-diabetic, according to the following plan:

Non-Diabetic	*Alimentary Tract*	Simple Hunger–vagabond Dyspeptic Cachectic
	Liver	Mineral poisons Bacterial poisons Drugs Foreign Albumins and Serums. Pregnancy Asphyxia
	Kidney	Diuretics Clinical glycosuria Phloridzin (Glycogen-Dextrin)
	Nervous System	Sympathetic–Piqure Asphyxia Infections Heat and Cold Fever Adrenal Thyroid Parathyroid Hypophysis
Diabetic	*Pancreas*	
	Nervous System	

Sugar appears in the urine under the greatest variety of conditions. Why is it that the small amount of sugar which normally circulates in the blood to the extent of 0.063 per cent does not make itself evident in the urine? To assume that the kidney acts as a sort of dam, over which the sugar flows when its height in the blood exceeds a given point, say 0.2 per cent, does not satisfactorily explain, for as we have seen, the limit of the ability of the tissues to utilize sugar is relative and not absolute.

The explanation may be that the kidney excretes only such sugar as appears in the blood in the crystalloid state, normal blood sugar being protected by some sort of chemical union. A union of blood sugar with lecithin has been demonstrated, the so-called Jecorin, and we speak of "Jecorin-like substances." When sugar in excess of the combining powers of the tissues is thrown into circulation, that portion which reaches the kidney in the crystalloid state is excreted. This view which permits the kidney no quantitative sense or regulatory power seems to me the rational one.

The belief that glycosuria presupposes hyperglycemia is usually, though not invariably, true, for it is occasionally seen both in human diabetes and in animal experiment that glycosuria persists in the presence of normal blood sugar.

Man's tolerance for carbohydrates varies within rather wide limits. Among other conditions, it depends upon whether the sugar is taken fasting, or with other foods. The rate of absorption is important. It is arbitrarily assumed that the individual who can take only 100 grams of sugar without the appearance of dextrose in the urine possesses a lowered carbohydrate tolerance, and various clinical tests depend upon this assumption. Von Noorden administers the sugar fasting. Naunyn gives about 100 grams of bread and 250 c.c. of milk, and then two hours later 100 grams of sugar. Most individuals can utilize sugar considerably in excess of this minimum.

The least important perhaps of all gly-

cosurias is that arising in the alimentary tract. It means simply that carbohydrates beyond the assimilative powers of the tissues have been eaten and absorbed.

Alimentary glycosuria, the so-called vagabond glycosuria, dyspeptic glycosuria, and that appearing in various cachectic states, practically all belong together. In the chronic starvation of certain dyspeptic and cachectic states, the tissues seem to become unused even to normal metabolic demands, and when there is given what under other circumstances would be regarded as normal carbohydrate diet they are taken by surprise, so to speak, and are unequal to the emergency. Thus, a certain amount of sugar remains uncombined and is excreted by the kidneys. This may be regarded as physiological or pathological, just as you please to view it.

Whether an alimentary glycosuria long continued can produce real diabetes is still a field for experiment. Today's evidence, based on both clinical observation and animal experiment, would indicate that the excessive use of sugar in the normal individual can never produce diabetes.

Because of its prominent and at times spectacular role in carbohydrate metabolism, the liver has been held responsible for various glycosurias, including even that of diabetes mellitus. But knowledge gained through animal experiment tends more and more to exonerate the liver and to place much of the blame elsewhere, frequently upon the nervous system. True, the liver does play an important contributory part in most of these states, but the blame for originating the glycosuric impulse must be sought elsewhere.

Numerous poisons, phosphorus, arsenic, and foreign albumins and serums can all, through their influence upon the liver produce glycosuria. The glycosuria of pregnancy and that of acute yellow atrophy perhaps belong here. Some of these agents, such as phosphorus, for instance, probably act through destruction of the liver cells, causing them to suddenly release their stored glycogen. Many other poisons exert their influence first upon the central nervous system and secondarily upon the liver through its nerve supply. The occasional glycosuria seen in the bacterial infections probably arises in this manner. The glycosuria of asphyxia, no doubt, is of nervous origin. It has been suggested that the appearance of sugar in the urine during pregnancy may be due to hyperthyroidism or perhaps to an unusually large adrenalin output with its consequent glycolytic influence upon the liver.

As a result of animal experiment we must ascribe to the liver a purely passive role in the production of various glycosurias. This organ is intimately concerned in the metabolism of carbohydrates, proteids, and fats, and is influenced by many factors, a disturbance of any one of which may so upset the normal course of metabolism as to lead, among other symptoms, to glycosuria.

A long continued, true hepatic glycosuria does not exist. Any injury or stimulus which will cause the liver to suddenly release its stored glycogen will temporarily produce glycosuria, but a permanent diabetes never results, and even those chronic diseases of the liver which are accompanied by most extensive parenchyma loss do not produce glycosuria. All of these so-called hepatic glycosurias are transient and are limited to the duration of the exciting cause, and no one has been able to connect them in any convincing manner with diabetes mellitus.

There is evidence, however, for assuming a genuine renal glycosuria. That produced by the diuretics, caffeine, for instance, is frequently the result of an untoward influence of the drug upon certain of the cerebral centers. In addition to this, a diuretic can, through the resulting polyuria, aid in the excretion of sugar where there exists a mild hyperglycemia which otherwise is not of sufficient intensity to lead to glycosuria. It must be borne in mind, however, that

polyuria alone can never be the cause of glycosuria, diabetes insipidus being the best evidence of this.

Phloridzin glycosuria unquestionably represents a true renal type, but the earlier belief that this drug increased the permeability of the kidney epithelium to sugar is giving way to another view. There is ground for belief that sugar thus excreted comes from some larger and more complex molecule, with which phloridzin is perhaps united in chemical combination. Numerous instances are known in normal metabolism where the pairing of some substance with another leads to its excretion, and it is conceivable that phloridzin may unite itself to some colloidal sugar compound and thus render it liable to a splitting within the kidney with consequent excretion of the sugar radicle.

Numerous clinical instances of renal glycosuria have been reported, it being not unusual to observe nephritis and glycosuria in the same patient. The glycosuria in such cases, however, is usually slight and temporary and is frequently dependent upon errors in diet with consequent hyperglycemia. It is, of course, not impossible to have nephritis and diabetes existing in the same patient, though there is an old belief among clinicians that the onset of nephritis in a diabetic leads to lessened glycosuria and other evidences of improvement. Before judgment, however, is passed upon such cases, estimations of blood sugar as well as that in the urine should be made, and their relation to the paradoxical law should be tested.

The nervous system in the last analysis originates the impulse which leads to most glycosurias. That Claude Bernard's puncture exerts its influence by causing the liver to suddenly release its glycogen is shown by the fact that this symptom ceases when the store of glycogen has been exhausted, and that no sugar appears in the urine if previous to puncture the animal has, through exercise or fasting, consumed all of his glycogen. Attempts to produce a permanent glycosuria analogous to diabetes by inflicting a permanent injury in this location have always failed of their purpose, even though the trauma persisted. Repeated and frequent piqûre gradually loses its effect, for the glycosuria resulting from each new operation is of ever less intensity. That this impulse is carried through the splanchnics is evidenced by the fact that if both nerves are cut no glycosuria results.

That the emotions have a very definite and real influence in the production of glycosuria is seen not only in clinical observation, but in animal experiment. Cats offer the best example of this among the lower animals, and the frequency with which sugar appears in the urine after the fright of being bound has given rise to the term "Fesselungs Glycosuria." In man, glycosuria and even diabetes, as a sequel of profound mental shock, is too frequently and reliably reported to admit of doubt, and I am constantly impressed with the powerful influence which the emotions exert upon the sugar output of diabetic patients.

The adrenals, thyroid, parathyroids, and hypophysis all have an influence, probably indirect and remote, in the production of glycosuria. By many writers, particularly those of the so-called polyglandular school, they have been endowed with diabetogenic powers. These glands, together with the pancreas, according to this view, bear to one another certain synergistic and antagonistic relations, the thyroid, adrenals and hypophysis forming one physiological group and the pancreas and parathyroids the other. It is said that the glands of the former group hasten metabolism and stimulate the sympathetic fibres, while those of the latter conserve metabolism and stimulate the autonomic nerves, the secretion of each being kept in check by the glands of the opposed group.

Hyperfunction of the adrenals is usually accompanied by transient, mild glycosuria, and hypofunction, such as is seen in Addi-

son's disease, is said to lead to increased sugar tolerance. Piqure glycosuria does not appear if the rabbit has been deprived of both adrenals, and painting the surface of the pancreas with adrenalin will produce glycosuria.

Deductions which endow the adrenals with specific diabetogenic powers do not take cognizance of its complex functions. The adrenal medulla is in most intimate relationship with the sympathetic nervous system, being perhaps an integral part of it, and thus influences every organ supplied by these nerves. No one has demonstrated an increase of adrenalin in the blood of diabetics, and we sometimes see cases of adrenalinemia with normal sugar tolerance. In short, no antagonistic relation between the pancreas and adrenal has been proven, and the latter certainly plays no etiologic role in diabetes.

Hyperthyroidism is occasionally accompanied by glycosuria, and patients with the myxoedema of hypothyroidism are said to have increased sugar tolerance, though exceptions to both of these rules are frequent. The glycosuria of increased thyroid activity is probably a toxic one, the result of excessive thyroid influence upon the liver. Here again no direct antagonism toward the pancreas has been shown. The parathyroids and the hypophysis in their relation to the pancreas have been comparatively little studied, but their influence in the production of glycosuria is probably indirect and remote.

None of these organs of internal secretion, excepting the pancreas, have at autopsy shown an anatomic relationship to diabetes, and there seems to be no good ground for looking upon them as in any sense truly diabetogenic.

Diabetes mellitus presents a form of glycosuria separate and distinct from all others, representing as it does a disease *sui generis*. Vast amounts of brilliant experimental work and painstaking clinical observation have brought us very close to an understanding of the etiology of diabetes, but a great deal yet remains to be worked out. It would be fruitless to discuss the various theories which have been held from time to time and are now largely discarded. The polyglandular view of Falta and others which I have just discussed seem to me to belong to this category.

All evidence, both clinical and experimental, would indicate that the pancreas is the organ most intimately concerned in the production of diabetes. Conflicting views as to whether the islands of Langerhans represent separate physiologic structures or are immature, perhaps reserve. Acini do not concern us, for whatever their ultimate nature, they are the structures in which the pathological changes characteristic of experimental diabetes are most often found.

Allen, by removing varying amounts of the pancreas of dogs, produces at will diabetes of any degree. The mildest he calls diabetes levis, and the severest absolute form in which the tissues utilize no sugar is termed diabetes gravis. If a dog with diabetes levis is by appropriate diet kept sugar free his remnant of pancreas when he is finally killed appears perfectly healthy and the islets intact. If, however, food in excess of his carbohydrate tolerance is permitted, as evidenced by continued glycosuria, he enters finally upon a severe form of the disease, and rigid diet is no longer effectual in rendering the urine sugar free. If this dog is now killed the islands will be seen to have undergone certain characteristic degenerative changes.

The dog with a pancreas remnant representing one-eighth or perhaps one-ninth of the original gland, and consequent diabetes levis, whose carbohydrate tolerance has been exceeded only slightly or for a short time, shows changes in the islands which Homans believes to be evidence simply of stimulation. In other appropriately treated animals, changes which he regards as characteristic of regeneration may be found, and in those with grave and continued diabetes, the islets show a characteristic form of complete degeneration, which are best described in his

words: "The acinous tissue is normal and presents its usual content of zymogen. Remarkable alterations, however, are noticeable in the islands of Langerhans. For the most part these structures, usually dense masses of closely-packed cells, have the appearance of irregular, coarse-meshed sieves. The cell outlines, the shrunken nucleus, a few mitochondrial filaments attached to fine shreds of protoplasm, alone are left. The secretory granules have disappeared." "Such changes are universally apparent in the pancreas of animals subjected to a rapidly fatal experimental diabetes. In instances of a less rapid manifestation of the disease, it is easy to see how islands may disappear or become altogether unrecognizable."

This demonstration of stimulation, of rest with regeneration, and of excessive activity with exhaustion and consequent degeneration, all depending upon whether or not the islet cells are able to meet the metabolic demands made upon them, is the most valuable contribution to the subject of diabetes which has been made in years. Its direct therapeutic application enhances wonderfully its value.

Why is it that such changes in the islets are not more frequently reported in the necropsy material from man? Many authors do report changes of this nature, while others deny their existence or at least their frequency in diabetes. Hanseman could not find that diabetes exhibited any unusual preponderance of island changes, though he found frequent disease of the acini and considered this characteristic of diabetes. Recently Labbé, Laiguel, Lavastine and Vitry have published their studies of the pancreas from nineteen diabetics and thirty-seven non-diabetics, in which they could trace no relation between diabetes and organic disease of the islands. Opie's observations to the contrary are well known. It is significant that those pathologists who have at their disposal the largest amount of autopsy material are most frequently adherents to the insular theory. Weichselbaum, in 50 per cent of 185 cases of diabetes, found evidence of degeneration of the islet cells and describes, among other changes, hydropic degeneration identical with that described by Allen and by Homans. In addition, regenerative changes, similar to those of experimental diabetes, have been found in the same pancreas alongside evidences of degeneration. We cannot escape the fact that true diabetes identical with that in man can be produced experimentally in animals only by removal or destruction of a large part of the pancreas.

Nevertheless, as some one has remarked, a pathologist who is asked to examine pancreas specimens from a large amount of autopsy material, would have a hard time picking out those from diabetic patients. The most plausible explanation is that in man we are studying a relatively mild form of diabetes in which functional pancreatic derangement predominates as opposed in animals to the diabetes gravis of extensive organic disease.

Evidently the islands of Langerhans contribute an internal secretion essential to carbohydrate utilization, and the lack of this substance produces diabetes. Something thus given to the blood by the pancreas acts upon the sugar, probably combining with it in order to give the tissues a handle, so to speak, by which they can grasp it and convert it to their uses.

This is no doubt a sort of stereochemical union, and the existence of a specific amboceptor in the secretion from the islets is assumed. There is abundant experimental evidence in support of the view that the body cells can fasten upon the sugar only by means of this amboceptor, and that its absence results in non-utilization of sugar. All attempts at modifying diabetes by feeding fresh pancreas or its extract have, however, been fruitless, as would be expected, since the bodies under discussion are of such delicate nature and are so easily destroyed.

But how can the amboceptor theory explain diabetes of nervous origin? For, from

authentic clinical evidence, we must recognize that nervous states not only influence the course of an existing diabetes, but that emotional and other shocks actually produce the disease.

The pancreas is abundantly supplied with nerves from the sympathetic ganglia, from which filaments go to the islands of Langerhans and come into intimate contact with its cells. Whether these nerves carry a direct secretory impulse or indirectly influence secretion through vasomoter control is in dispute, but their influence is unquestionable. It is possible that, under certain circumstances, the nice balance of the sympathetic system becomes so disturbed that the pancreas receives constantly an abnormal innervation. Changed bodily conditions, particularly of the abdominal organs, can produce such a state, and it is conceivable that even a single profound shock can so upset the nerve centers as to lead to permanent derangement.

In addition to clinical observations upon the ability of the nervous system to produce diabetes, numerous anatomical studies have been offered in support of this view. Rosenberger reports Windle as having found disease of the central nervous system and sympathetics in 153 out of 259 diabetics—more than 50 per cent—while Schmitz, at the other extreme reported only eighteen instances of important central nervous disease in 600 diabetics. It must be borne in mind, however, that these figures include all patients with nervous disease, such as paresis, tabes, brain tumor, etc., who incidentally have diabetes, many of them having developed the disease previous to the acquisition of the brain lesions. Diabetes of nervous origin cannot be likened to piqure glycosuria, for the former is usually slow in onset and frequently reaches its greatest intensity months after the initial injury or shock.

Thus it appears that there are only two diabetogenic organs, the pancreas and the brain.

We get a view of diabetes mellitus not only as an organic disease of the pancreas, as in animal experiment, but as a functional derangement of the islands of Langerhans. If this view is correct, we should endeavor in some way to discover the causes which alter this sympathetic mechanism, and by removing them to restore normal nerve balance—and, when this is done, to cure diabetes.

But is there not possible another sort of functional disturbance? Perhaps, after all, the islets depend for their normal stimulation upon some substance brought to them by the blood, just as the acini are activated by secretion from the duodenal mucous membrane. Attempts at finding this hypothetical substance or even its source have invariably failed. Pfluger did a great deal of experimental work toward this end, cauterizing and otherwise injuring the duodenal mucous membrane, but could demonstrate no influence on carbohydrate metabolism.

Yet many facts point to some sort of relation between the duodenal mucous membrane and the internal secretion of the islets, or, better perhaps, between the latter and the secretion from the acini. Witness the occasional improvement and even cure in experimental diabetes which follows permanent ligature of the pancreatic duct, or from a clinical standpoint consider the influence of Von Noorden's accidentally discovered oat cure. Certainly the absorbed end products of digested oatmeal are identical with that from all other starches, and no one has been able to show that the oatmeal offers to man any substance of peculiar value; yet in diabetes a diet of oatmeal gruel produces at times distinct improvement, due, no doubt, to the sedative effect of gruel upon the duodenal mucous membrane.

In connection with this relation of the duodenum to diabetes, I cannot forego a word regarding the possible etiologic influence of years of faulty diet—not of excessive sugar, for I think it has been shown that this probably can never produce diabetes in the normal animal, but of meats and other piquant foods. For we see diabetes melli-

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tus most often in those races and individuals who are most accustomed to what is termed "high living."

Before closing a discussion of the glycosurias and diabetes, some mention should be made of the practical results of the animal experiments above mentioned. The older writers knew that starvation benefited diabetes, and that to permit the continuance of glycosuria would result in lowered carbohydrate tolerance, but it remained for Allen, through his brilliant experiments, to explain this and to devise an entirely new and rational therapy, the essential feature of which is occasional and properly adjusted starvation.

His method of treatment is the direct result of these painstaking experiments. The endeavor is to keep the urine sugar free, and thus, through rest and consequent regeneration of the island cells, to restore some degree of carbohydrate tolerance. He does this by means of starvation, the patient being given no food except alcohol for 2, 3, 5, or even 7 days at a time. When the urine is once sugar free, it can usually be kept so by appropriate diet and occasional single starvation days. During starvation the patient receives liberal quantities of whiskey or brandy and sodium bicarbonate.

Feeding is resumed, not with fats and meats, but with small quantities of carbohydrates, preferably in the form of twice-boiled green vegetables. When there has been established a fair degree of tolerance for carbohydrates, say 80 grams, albumins and fats are cautiously added. The tolerance for each of the three classes of foods must be determined separately and the diet kept well within these limits, being increased only as tolerance is raised.

Recourse must be had to starvation, one day at a time, when sugar reappears, and, even without sugar, starvation days must be interspersed at regular intervals.

The diet must be planned with nicety and accuracy. As an aid in this, Locke's little book of food values has proven indispensable. I have put this book in the hands of patients who, after a little instruction, were able to arrange very satisfactorily their own diet. Joslin teaches them to examine the urine as well as to arrange the diet, and lets them return home to remain under "long distance treatment."

It seems essential to keep the patient's weight down. Most of them finally reach an optimum at which they do best, and attempts at increasing this weight frequently lead to trouble.

To enter upon a detailed discussion of Allen's treatment would transcend the limits of this paper, but two observations which have been impressed upon me seem pertinent. One is that mental and physical rest are valuable and at times essential adjuncts; the other, that when the regime is once started, careless feeding may bring rapid disaster.

During the past year I have used this treatment with several of diabetic patients. It is, of course, too early to judge. It may be after all that diabetes is an ever-progressive disease, and that treatment at best can only arrest its course for a time. But if anything will cure or modify the course of diabetes, the greatest promise seems to me to be in this mode of treatment devised by Allen.

To sum it all up, glycosurias are of two kinds, separate and distinct—diabetic and non-diabetic—the former an important part of a clearly defined disease complex, the latter a symptom of metabolic disorder arising in any one of a number of organs, the alimentary tract, the liver, the kidneys, or the nervous system.

THE CLINICAL DIAGNOSIS OF ACUTE LEUKEMIC STATES.*

By Lewellys F. Barker, M.D., Walter A. Baetjer, M.D., and Sydney R. Miller, M.D.,
Baltimore, Md.

Thanks to the gradual extension of hematological and histological technic, our conceptions of the leukemic states, acute and chronic, and of certain other conditions resembling them, are becoming more clearly defined. We have come to understand a leukemic state as one in which there is in the body definite proliferation of the leukopoietic tissues, either myeloid or lymphadenoid, and the appearance in the blood of immature white blood cells, usually in large numbers, the degree of immaturity being the more pronounced as the cases are more acute.

This definition of leukemia excludes Hodgkin's disease and the ordinary leukocytoses and lymphocytoses, since in these processes neither the blood picture nor the changes in the tissues characteristic of leukemic states are present. It also excludes the aleukemic lymphadenoses and the aleukemic myeloses in which, though the histological changes in the hemopoietic tissues may be identical with those of leukemia, the characteristic blood picture is absent. It is very probable, however, that the aleukemic lymphadenoses and aleukemic myeloses are closely allied to the leukemic states, for we have a great deal of evidence that acute leukemic states are often preceded by aleukemic stages. Moreover, in the course of an outspoken leukemia the hematological picture may change to that of an aleukemic state.

There is good reason for separating a group of acute leukemic states from the chronic leukemic states, for the mode of onset, the clinical symptoms, the course, the duration, the blood picture, and at autopsy the histological changes, differ. Whether the etiological agent is the same for the two groups of cases we do not yet know. It is possible that they are identical, though many investigators believe that the etiological agents are entirely different from one another. In favor of the identity of etiology is the fact that a chronic leukemia may have an acute onset or an acute termination.

With the majority of clinicians we divide the acute leukemic states into two great groups: (1) the acute lymphadenoid leukemic states, and (2) the acute myeloid leukemic states; or, if preferred, the designations (1) acute leukemic lymphadenosis and (2) acute leukemic myelosis may be employed. The clinical course is very similar for the various acute leukemic states, but the blood picture of the acute leukemic lymphadenosis is sharply separable from that of acute leukemic myelosis, and furthermore, the histological findings at autopsy in the cases that have been carefully studied and reported are specific. There are undoubtedly cases in which the blood picture alone may leave one in doubt as to which group the case belongs, though if the newer methods of staining be employed and especially if the ferments in the leukocytes be studied, it is nearly always possible from the blood picture alone to give the case its proper nosological position. It is highly desirable, however, that wherever possible the clinical diagnosis should be controlled by histological findings, as this disease is practically always fatal.

The greatest difficulty lies in deciding in a case in which all the cells are non-granular, and about the size of large lymphocytes, whether we have to deal with a large-celled lymphadenoid leukemia or with a small-celled myeloid leukemia due to the presence of micromyeloblasts. A careful study of the exact morphology and the staining reactions of the cells will usually suffice to distinguish, especially if the oxydase reaction and the indolphenol blue synthesis be used as a con-

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trol. It is erroneous to think that cases in which the lymph glands are markedly enlarged are necessarily instances of lymphadenoid leukemia, just as it is wrong to assume that marked enlargement of the spleen without enlargement of the lymph glands necessarily indicates that the leukemia is myeloid in origin. The lymph glands are often markedly enlarged in acute myeloid leukemia, and the spleen or the bone marrow may be predominantly involved in cases of leukemia which are not of myeloid origin. If an enlarged lymph gland be removed during life and subjected to careful histological study a decision could probably be certainly arrived at, for the lymphadenoid hyperplasia of acute lymphadenoid leukemic states is wholly different from the myeloid metaplasia met with in the acute myeloid leukemic states.

The object of the present paper is, however, not the discussion of the etiology of leukemia or a description of the pathological histology of the disease, but rather the presentation of an epitome of the blood findings and clinical symptoms in a series of acute leukemic states which have come under our observation. Our material includes some twenty-one instances of acute leukemic states, most of which have been studied in the medical service of the Johns Hopkins Hospital, though a few of them have been placed at our disposal by physicians in neighboring hospitals or by private practitioners. It is not our purpose to report all of these cases in full at this time, but in the lantern slides which are thrown upon the screen we shall present the blood picture in a dozen cases illustrating certain acute leukemic states proper and also acute stages in chronic forms of leukemia. We shall also refer to a case of atypical acute myeloid leukemia in which the blood picture closely resembled that of pernicious anemia, and also to a case of lymphemia apparently due to infection in which the blood picture might at first be taken for that of leukemia, but which we have not yet proved is associated with leukemic changes in the tissues.

Case I. A case representing an acute onset in a chronic lymphadenoid leukemia, the symptoms and the blood picture being of the acute type.

F. B., aged 65 years. Studied by courtesy of Dr. T. R. Boggs.

Clinical—Chills, sweats, fever, pallor, marked enlargement of all lymphatic glands, palpable spleen. Later, these acute symptoms declined, and the disease became chronic.

Duration—The acute symptoms lasted about four months.

Blood—R. B. C., 4,048,000; Hb., 62%; W. B. C., 182,000; P. M. N., 4.4; Fragile Lymph., 43.6; P. M. E., 0; L. Monos., 0; P. M. B., 0; Trans., 0; Lymph., 52; Myeloc., 0.

The blood picture was characterized in the acute stage by a high percentage of young, fragile cells.

Case II. A case representing an acute stage in a chronic lymphadenoid leukemia, followed by a leukopenic stage.

R. S., aged 21½ years. Johns Hopkins Hospital.

Clinical—Continuous fever, anemia, marked enlargement of all lymph glands, spleen and liver. Remission.

Duration—The high white count (50,000 to 8,500) continued for two weeks, after which the white count varied between 6,100 and 4,800.

Blood—R. B. C., 2,200,000; Hb., 30%. Differential count in the leukopenic stage: P. M. N., 7.3; L. Monos., 3.0; P. M. E., .6; Trans., 1.2; P. M. B., 0; N. Myel., .6; Lymph., large, 81.1; lymph., small, 6.2.

The blood at this stage is similar to that in aleukemic lymphadenosis.

Case III. A case of acute lymphadenoid leukemia with many large lymphocytes in the blood.

H. M., aged 32 years.

Clinical—Sudden onset, fever, marked anemia, hemorrhagic diathesis; general glandular enlargement.

Duration—From symptoms, 3 weeks; from diagnosis, 10 days.

Blood—W. B. C., 60,000-70,000; P. M. N., 4.4; L. Monos., 1.2; P. M. E., .4; Trans., .4; P. M. B., .2; N. Myel., .8; Lymph., 92.6.

Acute condition suggested by the large type of the lymphocyte present.

Case IV. A case of acute lymphadenoid leukemia.

A. B., female, aged 21 months. John Hopkins Hospital.

Clinical—Acute onset, septic temperature, progressive anemia, marked enlargement of all glands, liver, and spleen.

Duration—Death three weeks after onset of symptoms, two weeks after diagnosis was made.

Blood—R. B. C., 2,300,000; Hb., 30%; W. B. C., 267,000-171,000; P. M. N., 4.6; L. Monos, 1.2; P. M. E., .2; Trans., 0; P. M. B., 0; N. Myeloc., 1.6; Lymph., 92.4.

The blood picture is that of typical acute lymphadenoid leukemia of the large cell type with many (13%) large pathological forms. The few myelocytes present are of the mature type, indicating a slight irritation-myelocytosis.

Case V. A case of acute lymphadenoid leukemia with terminal leukopenia.

B. K., child, aged 18 months, a patient of Dr. John Ruhrah.

Clinical—Fever, rapid anemia, practically no glandular enlargement, spleen just palpable.

Duration—Death three months after appearance of symptoms; diagnosis two and one-half months before death.

Blood—W. B. C., 20,000 to 600 (estimated from smears); differential count showed constantly 85-95% lymphocytes with a variable number of large pathological forms except during a period of about two weeks following transfusion, when the blood picture became practically normal.

The blood picture was characterized almost throughout by a low count and by a high mononucleosis; there was a terminal extreme leukopenia.

Case VI. A case in which the blood presented a pronounced lymphemia, regarded as infectious, but not as a true leukemic picture.

P., aged 32 years. John Hopkins Hospital.

Clinical—Fever, purpuric eruption, marked enlargement of spleen.

Blood—W. B. C., 10,000; P. M. N., 24; Lymph., large, 60.4; Lymp., small, 10; total, 70.4; P. M. E., 1; P. M. B., 0; L. Monos., 3.3; Trans., 1.3.

The blood picture at first suggests that of lymphadenoid leukemia of the large cell type; whether we have to deal in reality here with an infectious (non-leukemic) lymphocytosis, or with a true leukemia is not yet certain.

Case VII. A case of acute myeloid leukemia in an infant.

L. F., female, aged 9 months, a patient of Dr. J. H. M. Knox.

Clinical—Fever, diarrhea, rapid anemia. No enlargement of the lymph glands or of the spleen.

Duration—Death three and one-half weeks after the onset of the acute symptoms; the diagnosis was made 12 days before death.

Blood—W. B. C., 200,000; P. M. N., 48; Trans., 0; P. M. E., 4.2; N. Myeloc., 18; P. M. B., 0; E. Myeloc., 1.6; Lymph., 30.8; B. Myeloc., .2; L. Monos., 0; Myelob., .4.

The blood resembles that of chronic myeloid leukemia except in the presence of a high percentage of lymphocytes, which is probably due to the age of the patient.

Cace VIII. A case of acute myeloid leukemia in an adult.

S. H., male, aged 40 years. Johns Hopkins Hospital.

Clinical—Onset sudden, septic temperature, rapidly developing anemia, exophthalmos, stomatitis. No enlargement of the lymph glands or of the spleen.

Duration—Death one month after onset of symptoms; diagnosis twelve days before death.

Blood—R. B. C., 970,000; W. B. C., 35,000; Hb., 40%; P. M. N., 21; Lymph., 2; P. M. E., .8; N. Myel., 52; P. M. B., 0; E. Myel., 6; L. Monos., 5; Mlb., 14.

The blood is similar to that of chronic myeloid leukemia, except for the high percentage of myeloblasts in association with a relatively low count.

Case IX. A case of acute myeloid leukemia, the white corpuscles becoming ever more immature as death was approached.

J. B. T., male, aged 47 years. John Hopkins Hospital.

Clinical—Sudden onset, septic temperature, rapidly developing anemia, otitis media, ulcerative stomatitis, hemorrhagic diathesis, liver and spleen enlarged, no enlargement of the lymph glands.

Duration—Death two and one-half months after onset of symptoms. Diagnosis two and one-half months before death.

Blood—R. B. C.—4,000,000-1,900,000; W. B. C., 17,000-280,000; Hb., 72-25%; P. M. N., early, 59.6; late, 25.7; P. M. E., early, 0; late .3; P. M. B., early, 0; late, 0; Lymph., early, 10.6; late, 6.7; L. Monos., early, 5.6; late, 14.0; Trans., early, 1.4; late, 4.3; N. Myeloc., early, 20.2; late, 25; B. Myeloc., .6; late, .8; Myelob., early, 2; late, 23.2.

The blood picture early suggests chronic myeloid leukemia. Later it developed into that of the typical acute myeloid type.

Case X. A case of acute myeloid leukemia of the chloromatous type.

E. P., male, aged 17 years; a patient of Dr. T. R. Boggs.

Clinical—Symptoms of acute infection, swollen eye, otitis media, moderate enlargement of the lymph glands and of the spleen, rapidly developing anemia, septic temperature.

Duration—Death three and one half months after onset of symptoms. Diagnosis seven weeks before death.

Blood—R. B. B., 1,900,000; W. B. C., 184,000; Hb., 40%; P. M. N., 3.4; Trans., .4; P. M. E., 0; N. Myel., 6.2; P. M. B., .2; B. Myel., 1.6; Lymph., 3.8; Myelob.: small, 34; medium, 46; large, 4.2; L. Monos., .2.

Unusual myeloblastic blood. The blood picture at first sight resembles that of acute lymphadenoid leukemia.

Case XI. A case of acute myeloid leukemia with many unripe marrow cells in the blood.

J. H. S., male, aged 31 years. Johns Hopkins Hospital.

Clinical—Septic temperature, hemorrhagic diathesis, rapidly developing anemia, no glandular enlargement.

Duration—Death three and one-half months after onset of symptoms. Diagnosis five weeks before death.

Blood—R. B. C., 1,200,000; W. B. C., 6,700-15,400; Hb., 28%; P. M. N., 17; L. Monos., 4.2; P. M. E.. 0; Trans., 0; P. M. B., 0; N. Myel., 3.6; Lymph., 6; Myelob., 69.2.

The blood on cursory examination might easily be mistaken for that of an acute lymphadenoid leukemia. The cells classed as myeloblasts closely resemble the cells described by Pappenheim as lymphoidocytes.

Case XII. A case of acute leukemia with severe anemia.

B. G., male, aged 26 years; a patient of Drs. Leopold and Sexton.

Clinical—Sudden onset, rapidly developing anemia, coma, no glandular enlargement, spleen moderately enlarged, septic temperature.

Duration—Death twelve days after onset. Diagnosis made five days before death.

Blood—R. B. C., 1,100,000; W. B. C., 40,000; Hb., 18%; P. M. N., 31.2; L. Monos., 3.2; P. M. E., 6.8; Trans., 5.4; P. M. B., 0; N. Myeloc., 2.4; Lymph., 51.

The blood picture is that of a marked anemia with a large number of nucleated R. B. C., the number of these being even greater than that of W. B. C. The W. B. C. are young and atypical; many are fragile forms. The picture suggests that of pernicious anemia, but is in reality that of a leukemia. The term leukanemia should be avoided.

Autopsy Findings—Acute splenic tumor, splenic and hepatic infarcts, cloudy swelling of viscera.

"Clinical and Hematological Pictures in Acute Infections Simulating Acute Leucemia," by W. A. Baetjer and S. R. Miller, Baltimore, discussed in connection with Dr. Barker's paper, will appear in our March issue.

DISCUSSION ON THE PAPERS OF DRS. BARKER AND BAETJER.

Dr. George Dock, St. Louis, Mo.—On account of the lateness of the hour, I shall not venture on a discussion of these papers, much as I would like to. I consider them the most valuable contributions to the study of leukemia that have been made for a long time. They attack the root of the most important part of that problem. The work illustrates the necessity of much more careful blood studies than are often made if one is going to avoid avoidable accidents. In this connection I would like to mention two cases. Warthin and I reported a case that was brought into the hospital at midnight with a diagnosis of appendicitis. The history was typical. The surgeon made preparations for operation. A blood count was made and showed 90,000 leucocytes. No differential count was made. Formerly, a count as high as that would have made the diagnosis of leukemia clear, but one can have a leucocytosis as high as that without leukemia; recently I had a case of colon infection with 90,000 leucocytes. A differential count was not made. Operation was performed, and when the appendix was examined histologically it was found to be leukemic. Several smears had been kept, and examination of these smears showed atypical leukemia.

In a much more recent case, only a few weeks ago, a man, about 50 years of age, was taken with what seemed to be an acute parenchymatous tonsillitis, and after the usual treatment had failed a specialist, after having made two incisions in the tonsils, and failing to get pus, concluded he was dealing with parenchymatous inflammation, if not with a suppurative condition, and proceeded to take out the tonsils. A blood count showed 40,000 leucocytes. Shortly after the operation it was found the patient had a count of 200,000 cells, and the spleen was enlarged, and the day before he died he had the typical picture of lymphatic leukemia, except he had no enlarged glands.

It is not enough in cases which seem apparently simple to make a blood count with a blood counter and stop. The examination of the blood in such cases as Dr. Baetjer and Dr. Barker have presented to us is difficult. The most experienced blood examiners have difficulty in interpreting such blood, but at least one can say whether the case should go on to operation or make a more thorough examination.

One point I would like to emphasize is that to which Dr. Baetjer has called attention. I have not followed the practice in leukemic cases of telling the patients that the disease is always fatal. Theoretically the condition should be curable for a number of reasons. If the cases are seen early enough they should get well; therefore, in every case an effort should be made to carry out treatment. If you tell a leukemic patient he is going to die, you lose a valuable opportunity of making a study which should be made in such a case, and it may be that anyone will be fortunate to see a case recover. I have had the

satisfaction of seeing life prolonged with high functional activity.

Dr. Frank A. Jones, Memphis, Tenn.—I do not think, after these masterly papers have been contributed, there is very much to discuss. Certainly the authors have brought our knowledge with reference to these leukemias up to date.

I often think of the dictum of Leube with reference to the leukemic states, that they are lawless and know no law. They are veritable anarchists. In my experience the lymphatic leukemias are acute and come on very rapidly.

I want to relate briefly a case that was referred to me, the history of which is about as follows: About two months previously, a patient who was in the pink of health physically, was attacked violently with tonsillitis associated with arthritis, with high temperature and sweats. A few days after the tonsillitis and arthritis developed, the physician stated the patient had agonizing pain over the gall-bladder, with vomiting and diarrhea. I was called and examined the case thoroughly, sifted everything out, and found he had lymphatic enlargement in the axillae and groin, and the cervical glands were small in size, not larger possibly than buckshot. With the onset of the tonsillitis and arthritis, with violent pain radiating over the abdomen, I revolved in my mind the question of acute lymphatic leukemia, and had a blood analysis made, and the blood count showed typical lymphatic leukemia. The patient died two weeks after being sent home.

There is great diversity of opinion among the German, French and English schools with reference to these leukemias. Leube says you cannot distinguish true lymphatic leukemia from mild leukemia. Leube in his post-mortem examinations has held that where a diagnosis of lymphatic leukemia has been made post-mortem examination has shown marked changes in the spleen. The splenic enlargement is more puzzling to me in all rapid myelogenous splenic leukemias than in the acute lymphatic leukemias. In these leukemic states about the best definition that we can give is that a blood storm results. Unfortunately, we do not know what the infection is, but it is a violent cyclone; it is a storm just as bronchial asthma is a broncho-pulmonary storm of some kind; just as epilepsy is a cortical brain storm of some kind.

I regret to say that I have never yet had a case of either chronic or acute lymphatic or myelogenous leukemia come under my observation but what promptly died. I have never yet had one of them recover.

A word with reference to the classification of these leukemias and Hodgkin's disease. We have been hearing from Bunting and Yates, who are and have been doing considerable work in connection with Hodgkin's disease, and who claim to have discovered the microorganism, etc. We learn something about the histological aspects of the glands in Hodgkin's disease.

I would like to ask the pathologists why do we classify Hodgkin's disease as a disease of the lymphatic system and classify leukemia as a disease of the blood? I do not think the classification is right as regards the blood picture we have, but we have a dividing line only in the pseudo-leukemias. The only difference is the blood picture practically. Let us take Hodgkin's disease, and it will come on rapidly. Take the histological aspects presented by the blood in Hodgkin's disease and you will find these patients die promptly as if it were a true leukemia. These diseases have got to be sifted out pathologically. They ought to be classified better.

Dr. W. A. Dearman, Long Beach, Miss.—The presentation of these two papers is of vital importance to the association, and I have really enjoyed them as well as any papers that I have heard read.

While I have never had an acute lymphatic leukemic case to come directly under my observation, yet I have been more or less acquainted with the chronic types of the disease and the blood pictures presented in these cases; yet I wish to call attention to the fact that we are very likely to mistake these cases of acute lymphatic leukemia for cases of diphtheria, acute tonsillitis, Vincent's angina, and often make a long-drawn-out conclusion with a pneumococcus invasion of the throat.

There is no diagnostician who can differentiate clinically between a streptococcus angina, an angina with formation of false membrane due to the ordinary pathogenic micro-organisms, diphtheria, Vincent's angina and acute lymphatic leukemia.

A few days ago in my laboratory I was called upon to make a culture from the throat of a child who was suspected of having diphtheria—a very obstinate case. The Klebs-Loeffler bacillus was persistently negative. The membrane began to spread and another swab was brought in, and this also was negative on culture and microscopic examination. The child developed a hemorrhagic diathesis. It had frightful epistaxis, hemorrhages from the bowel, hemoptysis, hemaemesis and died on the tenth day. I did not come in personal contact with this child; however, the physician in charge, who related the circumstances to me, made a desperate struggle to satisfy himself in diagnosis, feeling that he might be unjustly criticised by the 8,000 people constituting the town, the father and mother, and spectators who were present during the illness.

The patient was a girl, eight years old, of a prominent family. Several physicians who are well in keeping with the progress in modern medicine were called in consultation, as well as a specialist, in eye, ear, nose and throat work all of these failed to satisfy themselves as to the diagnosis.

I will admit that since I have heard these most excellent papers dealing with acute lymphatic leukemia and the discussions following and, while I have never had a case of this kind to come under my care, I feel confident, from the history and the symptomotology of the disease, that the case I have just related was one primarily of acute lymphatic leukemia.

The county health officer invaded the home without authority from the parents when they were absent to bury the child, so I am informed, fumugated the house, much to the embarrassment of the family on their return, and the last information I had in regard to the situation, the case was about to assume medico-legal proportions.

Dr. Stewart R. Roberts, Atlanta, Ga.—I would like to ask Dr. Barker in closing to state in as few words as possible the present classification of the leukemias, and just why he makes that classification. One of the reasons why I ask this question is because I have noted the negroes in Georgia who have leukemias, that the ordinary classification of lymphadenoid and myeloid types have seemed to overlap.

Dr. L. F. Barker, Baltimore (closing)—As to Dr. Roberts' question regarding classification, I feel that my colleague, Dr. Baetjer, has done well to recognize as distinct forms the lymphatic and myeloid types, and we will do well to enunciate both the chronic and acute forms of each. We recognize, however, that within these groups there are very remarkable differences in the single cases. If we speak of these main groups and describe what we find in cases, we may later on subdivide each of the main groups into subordinate groups.

THE PHYSICS OF BRONCHO-PNEUMONIA.*

By Philip F. Barbour, M.D.,
Louisville, Ky.

The two important aspects of the physics of broncho-pneumonia concern themselves with the respiratory and circulatory systems. However varied the cases may be in their symptomatology, the adequate performance of the lungs and heart will be necessary for the preservation of life. We are sometimes led to treat the disease according to its name rather than considering the basis upon which that treatment must be founded.

Broncho-pneumonia will vary in its symptoms according to its etiology. Those cases which are primary in their origin may present more acute symptoms than those which are secondary to other diseases which may in some measure complicate the beginning. Roughly speaking, we may say that the symptoms that are more markedly apparent may be those of the bronchial system in which an interference with respiration will be the most alarming condition. Or the symptoms may be more evidently those of a pneumonia with great toxemia and cardiac failure, or there may be a mixture in varying proportions of these two aspects of the disease.

While broncho-pneumonia may be the primary disease, the number of such cases is very small as compared with those in which it comes on either acutely or insidiously in the wake of other diseases. In children the most common history is that of a rhinitis followed by laryngitis, then bronchitis. In adults the progress of such inflammation reaches only to the third or fourth division of the bronchi. In children, especially very young children, the resistance to the various organisms causing bronchitis is not sufficient to hold or stay the progress of the infection, so that the inflammation extends along the mucous membrane to the smaller tubes. We can measure this extension by the change which takes place in the pitch of the rales and their increasing fineness. As the inflammation approaches the finer bronchial tubes we shall find that the cardinal symptoms of inflammation (P. H. R. and S.) will be present, but that there will be a new factor to be considered. In the larger or even the medium bronchi moderate swelling of the mucosa will offer slight if any obstruction to the entrance of air to the air cells, because the lumen of the bronchi is far larger than is absolutely necessary to their function. There are also in the wall of the bronchi irregular masses of cartilaginous or fibrous tissue which help maintain the patency of the tube, but when we reach the bronchiole the histology of the wall changes. The cartilage is no longer present, the wall will consist of the thin, flat mucous cells surrounded by involuntary muscular fiber and, interlacing and binding the bronchiole to the lung tissue proper, the fibrous tissue which here forms part of the wall of the bronchiole and there will branch into the wall of the acinus. So the inflammation which was a bronchiolitis on one side extends through the side wall and is a pneu-

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monitis on the other side. Capillary bronchitis is always a broncho-pneumonia. The wall of the bronchiole is no longer rigid from cartilage, but collapsible if the tonus of the muscles is diminished.

A clinical experience familiar to all of us may bring more forcibly to us the problems which will confront us in such cases. A child of two or three years of age has a bronchitis which has descended to the third or fourth division of the bronchi just as would be the case in the adult. Then there is an extension of the inflammatory process to the smaller tubes. A trained observer noting restlessness, the deepening color, will know that the child is worse. The temperature has jumped to 104 degrees. We know without examination that the case is already one of bronchitis plus pneumonia. This child is desperately ill. Why? Not because of the high temperature alone, for children have lived many weeks though suffering from high temperature from typhoid fever or tuberculosis or even chronic malaria. Nor is it from the toxemia alone. It is from the mechanical difficulties in respiration and circulation. When the inflammation is in the larger tubes the results of the inflammatory action is the formation of mucus, which in part is the outpour of the muciparous glands which lie in the wall of the bronchus and in part is made up of the mucous cells themselves, which are destroyed in the process of the disease and are thrown out into the lumen of the bronchus to be expectorated. This mucus at first is tough and tenacious, and to that extent and in that way interferes with respiration. The large size of the bronchi, however, enables the lungs to inspire through this mucus with little difficulty. In the adult and the older child there will be little real difficulty in the air reaching the air cells. But when the inflammation has reached the smaller bronchi and especially the bronchioles the lumen of these is so lessened that a very small amount of the mucus will serve to stop up to a certain extent the bronchiole so that no air can pass through.

In addition to the mechanical interference of the mucus there is a spasm of the circular muscular fibers in the wall of the bronchiole. That this spasm does take place is made evident by the characteristic rales of a fine whistling type. If the number of the bronchioles involved is at all great there will be a very noticeable duskiness of the face, even if there is not a distinct cyanosis. This first stage of inflammation of the bronchi and bronchioles is frequently termed a suffocative bronchitis and is rather sudden in onset. The mucous membrane swollen, congested and dry with the muscles in a state of spasm will practically occlude that area of the lung and the restlessness and air hunger mark the interference with normal respiration. If there is in addition a pneumonia with the lessened aeration, and with the high temperature which demands more oxygen, the problem is shown at once to be grave. The interference with respiration is so great that in young infants the diaphragmatic insertion and even the intercostal spaces will often be drawn in by inspiration almost to the same extent as in a laryngeal stenosis. Now add to this the softness of the bones in the thoracic walls, the weakness of the muscles of respiration and the ignorance of the young child as to how to aid nature in removing the mucus, and the difficulty of our position is evident. En passant, it may be said, that our therapy must be addressed to the relief of the congestion and the spasm, and so we find that such agents as will draw the blood away from that area, and antispasmodics, will prove helpful. The use of warm baths, mustard paste or packs locally, aconite or tartarmetic internally, nitroglygerin or nitrites or belladonna to allay spasms have all proven helpful.

The difficulty in respiration is increased by another factor during this stage and also later. The type of breathing in children,

and especially in infants, is largely if not wholly abdominal. In laryngeal stenosis there will, of course, be some costal respiration, but the diaphragm even here does most of the work. The state of the abdominal cavity then has much bearing upon the work of the diaphragm. If the abdomen is distended and tympanitic, there is great mechanical interference with respiration. There will also be a true nervous reflex through the pneumogastric nerve, altering the regularity of rhythm of the respiratory act. It is highly important that digestion be conserved and the normal functioning of the gastro-intestinal system. This is difficult because of the general disarrangement of the bodily functions, and particularly because of the mucus which in young children is always swallowed, rarely expectorated. Mucus is a promoter of fermentation in the bowel and causes a distention, which in turn hampers the breathing. Many physicians on account of this difficulty have been forced into almost a therapeutic nihilism for fear of the untoward results of food or medicine which is not properly cared for by the abdominal organs. It is proper here to mention the very close relation between certain intestinal conditions and the onset of a broncho-pneumonia. Age-long experience has shown the value of a dose of castor oil in preventing a bronchitis and its sequelae.

Another mechanical factor is the difficulty of inspiration through the nose, when the accompanying coryza persists and which forces mouth breathing and interferes with nursing and rest. Following the stage of acute congestion of the bronchi is the stage of secretion, which will vary with the amount of lung attacked and the direction and extent to which the inflammation has proceeded. It is perfectly possible to have an acute congested bronchiole in the state of spasm in one portion of the lung, and in another lobe free secretion will have been established. During the later stages of the disease the problem of the maintenance of the respiratory act must be kept in mind, because with the cessation of the inflammatory process there is the resolution of the pneumonic masses, which in some measure will be absorbed through the lymphatics, but also must be expectorated, and so increases the amount of mucus and detritus in the smaller bronchi. At this stage there is a very real danger from the secretions which may drown the child by overfilling the bronchi. The danger is no longer from capillary congestion or from spasm of the circular muscular fibers, but from the large amount of this semi-fluid material which fills up even the large bronchi, and which may be heard as large, soft, mucous rales over the whole back and through which air bubbles as it is inspired or expired. Let us study a little more closely the mechanical problem in this case. The circular muscular fibers in the wall of the bronchiole are thought to have the function of carrying out of the bronchiole by a reverse peristalsis any material, mucus, etc., which might be present in its lumen. This peristaltic wave squeezes out the foreign substance until it reaches the larger bronchi, where the currents of air or the action of the ciliated epithelium can bring it to the bifurcation of the trachea from which the mucus can be expectorated. But in broncho-pneumonia the wall of the bronchioles and the muscles have undergone inflammatory changes from the very character of the pathological process which occurs there, so that the peristaltic wave cannot functionate normally. The broncho-pneumonic process has practically welded bronchiole and air cell into one turged, congested, infiltrated mass, and neither muscle response or elastic recoil is possible.

We must remember, also, that the charac- of the exudate and probably its disposal are different from that which obtains in the course of a frank or lobar pneumonia. The characteristic formation in the air cell in pneumonia is a fibrinous mass in which red and white blood cells, some plasma and the

pneumococci are meshed together by fibrin. At the proper time resolution takes place by the digestion of the fibrin just as will take place in any part of the body where there is an outpour of fibrin. Lipase, whether a function of the white blood corpuscles or from some other source, liquifies the fibrous clot and the lymphatics do most of the absorption. But in catarrhal pneumonia the exudate is little if at all due to the pneumococci and is not fibrinous, so that on section of the lung the contents of the air cells may be squeezed out as a catarrhal material with mingled mucus and epithelial cells. Now, the mucous material is apparently not digestible in the body, certainly only a small fraction of the quantity can be taken up by the lymphatics, so that it must be carried out of the lungs through the bronchi. It mechanically interferes with respiration and must be removed. When the quantity as large, as it often is, the problem is a serious one and taxes our therapeutic skill to the utmost, for the mucous material may fill and usually does fill not only the bronchi, which have been the active seat of the inflammatory process, but the other bronchi which may have been affected little if any. This secretion, laden with active bacteria, and insufflated or inspired into portions of the lung not yet affected, may attack and create new foci of inflammation, thus prolonging the disease and lessening the chances of recovery.

The administration of alkalies throughout the disease will tend to lessen some of the acidosis which accompanies pneumonia. They will render the mucus far less viscid and so make the expectoration less difficult. Frequent changes of position will by the force of gravity tend to move the accumulations. The baby's head may be lowered at the time of coughing or for periods of time so as to facilitate drainage. Belladonna will diminsh the mucus if pushed to full effect, so that the amount to be handled is less. It also slows and deepens the respiratory act and enables the air to get behind the mucus. Strychnine will arouse the reflex activities of the muscle fibers, so that such bronchioles as are not wholly crippled by the inflammation will be energized to contract and remove the contained material.

The question of removal of the mucus by emesis must often arise and must be determined by the individual case. The prostration is sometimes severe and out of proportion to that which was to be expected. It is far safer to use only the mild emetics, such an ipecac. Apomorphin is too depressant, and its action is not limited by the emesis as would be the case with locally acting emetics.

There has arisen much discussion about the value of cold, fresh air in the treatment of the pneumonias. It is thought that the toxemia of lobar pneumonia is much benefited by the inhalation of cold, fresh air. The essayist believes, however, that it is an entirely different proposition in the case of broncho-pneumonia. Cold itself may increase the congestion of the mucous membranes just that small amount that will result in a blockade of the lumen of the smaller bronchi and bronchioles. In an adult this might not mean much, but in the young child or even in the elderly the additional mechanical interference with respiration may prove the deciding and fatal factor. Fresh air should be insisted upon, but that fresh air should be warmed to the extent that it will not prove an irritant to mucous membranes congested and inflamed to the limit of tolerance.

There is no phase of the pneumonia problem which is less thoroughly understood than the relation of the heart to the two phases of pneumonia. Indeed, a full comprehension of the cardiac activities will help in the handling of pneumonia more perhaps than any other knowledge of the disease. There seems to be a widespread advice to give heart tonics or stimulants in this disease without any very clear-cut idea as to what is to be

accomplished. The problem in lobar pneumonia is essentially the maintenance of the heart activities, because death comes more frequently from the failure of the heart than from any other source. When we look upon a consolidated lung we can appreciate the burden which has been put upon the right ventricle. Not only do we contend with an acinus filled with epithelial cells, fibrin, corpuscles, bacteria, but the capilliaries are swollen and relaxed, the elasticity of the blood vessels as well as the wall of the acinus is lost. The tissues are oedematous and the blood is partially stagnated in the whole lobe if not in a larger area. But there is an increased demand for oxygen because of the temperature and the fever and the toxemia. The aerating surface of the lung is diminished by a fourth or more. So that the remaining lobes must overwork in order to supply the increased demand for oxygen, and then the blood which was distributed through the pulmonary arteries must be forced through vessels whose total calibre has been reduced by about one-fourth. The blood pressure in the pulmonary area is raised, and so the recoil of blood in the pulmonary artery accentuates the second pulmonary sound. This accentuation is then a measure of the ability of the right ventricle to overcome the increased resistance in the pulmonary circulation. One can measure the extent and degree of that consolidation by estimating the accentuation of that sound. When it becomes feebler one may look for dilation of the right heart, increased area of dullness of the heart, the movement of the apex beat to the left and the other signs of a failing heart. In childhood we are helped by the fact that the right ventricle relatively is stronger than in older life and has not been weakened by the vices of the adult or the acquired weaknesses that follow in the train of the various toxic infections resulting from the contagious diseases. This picture is drawn that it may be compared with the findings in a case of broncho-pneumonia. Here we shall find that the spots of consolidation most frequently are small as compared with that found in the frank pneumonia. There are sometimes several areas which to some extent may almost coalesce so that there will be areas of intense and less intense congestion close together. The pathway of the blood is not so much interfered with, and so the pulmonary second sound does not become accentuated to anything like the same degree. In broncho-pneumonia some if not much of the area involved lies in the domain of the bronchial arteries which come from the left ventricle, and much of whose blood passes into the bronchial veins which empty back into the right auricle. The increased resistance then is in the area of the left heart. It is true that the capillaries of the bronchioles empty into the pulmonary veins, but they do not add anything to the resistance to be overcome by the right ventricle, because the force which drives the blood through them is derived from the left ventricle, and in fact relative to the total amount of blood in the systemic circulation is a negligible quantity. The maintenance of the pulmonary circulation then is not a difficult matter when the right ventricle has to overcome a resistance in a comparatively small area of the lung. But the second pulmonic sound gives us a sure and trustworthy evidence of that increased or increasing pressure, and will indicate to us when the right heart has an added burden. When that right ventricle does have this additional work thrown upon it, and the respiratory mechanism is taxed to the utmost to convey air to the air cells, one can appreciate the significance of the double problem, and explain satisfactorily at least to himself the fatal issue which almost surely will occur.

Heart failure may occur from the general systemic exhaustion of a disease which may relapse many times by fresh incursions into previously unaffected pulmonary areas. It may be guarded against, for it is not apt to

develop suddenly, as is so often the case in croupous pneumonia.

Such a conception emphasizes the necessity of the prevention of even the slightest colds and coughs which contain within themselves potentialities of the greatest significance and danger. It is possible to stop or abort such inflammations at the start, but, like a fire that has gained headway, the development may soon be beyond our control.

DISCUSSION.

Dr. I. L. Van Zandt, Fort Worth, Texas.—In my country it is generally understood that I do not allow a paper on pneumonia to go by without comment.

The discussions on the subject of cold or warm air for pneumonia have interested me very much. A cold air saturated with moisture becomes a very dry air when warmed, and may, on account of its drying effect on the air passages, be detrimental to some cases, and they do better in cold air. Yet my own personal observation has been that a patient in a cold room, or cold part of a room, was made better by warming the room, or, if this was not feasible, moving the patient up close to the fire. The cough thereupon became less distressing and expectoration more free and easy—some patients showed a decided avidity for the warm air. Moreover, I have had patients made worse by a change from warm to cold. I certainly wish the room to be well ventilated.

With reference to broncho-pneumonia I will say that two years ago I read a paper before this association at Lexington, Ky., in which I took the ground that bronchitis and pneumonia, being of the same microbic origin, yielded to the same treatment, notwithstanding the microscopic differences.

My experience for many years has led me to believe that creosote in some form, a saturation with it, is destructive to the pneumococcus. In this, here in Texas, I have many followers. Also I early came to the conclusion that creosote alone did not reach some cases, particularly the broncho-pneumonias of babies, which are largely of mixed infection origin. In these I find an efficient adjutant in collargolum in the form of Ung. Crede well rubbed in.

THE DIFFERENTIAL DIAGNOSIS OF THE SKIN MANIFESTATIONS IN PELLAGRA FROM OTHER DERMATOSES.

By Cosby Swanson, M.D.,
Atlanta, Ga.

There is perhaps no disease that is discussed by the profession and causes as much anxiety in the minds of the general public as pellagra, nor is this wide interest without justification on account of the extreme gravity of the disease.

In pellagra we are compelled to make a differential diagnosis on clinical grounds alone; we have neither definite etiological knowledge nor laboratory diagnostic methods. The differential diagnosis of the skin manifestations of pellagra is usually very easy to a trained dermatologist. Although there are many diseases in which the symptoms closely resemble pellagra, for example, depression, gastro-intestinal symptoms with skin manifestations similar to the rash seen in pellagra. The purpose of this paper is to consider these conditions and their differentiation from pellagra.

The following diseases often have skin manifestations that resemble the eruption of pellagra: acrodynia, erythema, solare, erythema caloricum, erythema ab igne, erythema pernio, erythema multiforme, eczema, especially the erythematous form, trade dermatitis, dermatitis venenata, "recurrent summer eruptions," lupus erythematous, syphilis, xerodermia, erysipeloid, "erysipelas faciei perstans."

The skin manifestations in pellagra present three stages, congestion, thickening and pigmentation, and atrophic thinning. The eruption often begins as a macule which lasts for several days and in some cases several weeks. In most cases the lesions fuse in a very short time, forming a patch of livid red erythema covering a large area. The erythema may reach its height of development suddenly, but as a rule it does not for several days.

The tissues are generally swollen, due to the increase of both blood and serum in the derma. After a few days the edema is less marked, the redness begins to fade somewhat and the surface becomes covered with scales of disquamated epithelium. This hyperkeratosis usually continues throughout the

entire course of the eruption. In some cases vesicles, bullae and ecchymotic lesions complicate the process. In cases where bullous lesions are found the loss of the epidermia is usually very extensive, leaving raw, bleeding surfaces which become infected with pyogenic organisms, often forming pustules and in some case ulcerations, leaving painful cracks and fissures. In mild attacks of the eruption the erythema disappears in a few days and the skin resumes its normal appearance, but after several recurrences the area becomes pigmented, thickened, later atrophies. During the stages of retrogression the skin gradually loses its rosy tint, leaving exfoliation of the epidermis for several days or weeks.

In some cases the eruption is subacute or chronic in nature. The erythema comes on slowly, very little edema is present and the tissue becomes more or less permanently thickened, forming hard, roughened, scaly surfaces. The skin loses its elasticity and its normal lines are exaggerated.

The eruption is usually seen on the dorsum of the hands, wrists, back of the forearms and elbows, the dorsum of the feet, on the ankles, legs and knees, the face, neck, ears, forehead, at times other parts of the body may be involved the axillary folds, the internal surface of the thighs, around the anus and on the scrotum, vulva and in exceptional cases, the entire body.

One of the most characteristic features of the eruption is its symmetrical distribution. A skin lesion seen on one hand or arm is almost sure to be duplicated on the other hand or arm, or one showing on one side of the face, or one part of the body, is equally seen on the corresponding side or part. The eruption on the hand usually begins on the knuckles, rapidly extending over the entire back of the hand; in some cases spreads to the forearm and even to the shoulders. The eruption on the face usually begins on the bridge of the nose, forehead, neck, and in some cases gradually extends over the entire face down to the sternum. The eruption on the feet usually begins on the dorsal surface, spreading to the legs, knees and in some cases to the thighs.

The rash is usually characterized by a sharp red line of demarcation, with rough, dry skin around the borders of the dermatitis.

The color of the eruption in pellagra possesses certain peculiarities and is of the greatest importance. In the beginning of the eruption it is usually a bright red, resembling a sunburn; as the disease advances the color deepens, assuming a reddish-brown or chocolate hue. In some cases it is a pale red and gradually changes to a bluish color. In mild cases the color disappears in a few days, but in most cases it is noticeable during all stages of the eruption. In the negro the color of the eruption is black, like soot, and at certain angles a gray tint may be apparent.

In pellagra itching and a burning sensation often precedes the eruption. After the eruption appears, itching is never marked and is usually absent. Scratch marks are rarely ever seen in pellagra unless some other skin condition is present. The eruption generally reappears annually, most often during the early spring or fall. When the eruption appears during the early spring and is mild in character it may recur again during the fall, but this is the exception and not the rule.

On the other hand, the skin manifestations of pellagra are not necessarily connected with such external causes as atmospheric or solar influences, as is believed by many observers, but the application of any irritating substance may excite the eruption. The severest skin manifestations of pellagra are seen in those who have been exposed to direct sunlight. Cases are often seen in which the rash appears for a very short time and never recurs. This is due largely to the fact that they are not exposed to the sun. The

influence of the sun is probably the reason why more cases of pellagra with severe skin manifestations are seen in the rural districts than in the cities.

DISEASES SIMULATING PELLAGRA.

In acrodynia (erythema epidemicum) the skin manifestations are like the eruption seen in pellagra in many ways. It usually begins as an edematous swelling of the hands, feet, and face, followed by an erythematous rash upon which vesicles and bullae develop. As the erythema subsides there is exfoliation of the epidermis leaving the skin thickened and pigmented. The other symptoms of the disease are indigestion, diarrhea and depression, but usually of a short duration.

The rash is unlike pellagra, in that it runs a shorter course, rarely ever recurs, and is a very rare disease in this section.

The eruption that occurs in erythema solare resembles in many respects the early rash that occurs in pellagra.

In some cases the erythema from the exposure to the sun is very severe, causing an acute erythematous rash of a bright red color, often forming vesicles and bullae. The acute eruption is followed by exfoliation of the epidermis; later, pigmentation takes place.

The severity of the dermatitis from the sun depends largely upon the season, the duration of the exposure, sensitiveness of the skin, condition of the person's health. The reaction is more marked in persons suffering from any toxic condition.

The erythema from a sunburn presents, on close observation, several features which distinguish it from pellagra. In this condition the area is usually less acutely inflamed, there is less redness, and gradually fades instead of becoming darker, as does pellagra, and is followed by less exfoliation of the epidermis and very little pigmentation.

The skin manifestations in erythema multiforme often assume many of the characteristics of the eruption of pellagra. The lesions that are usually seen in erythema multiforme are macules, papules, nodes, with the occasional appearance of vesicles and bullae. The lesions in the beginning are usually discrete, occurring in groups; some cases fuse later and cover large areas. The rash occurs bilaterally on the hands, forearms, neck, chest and lower limbs, occasionally on the face and body.

The eruption assumes a crimson red or a purplish red color.

Erythema multiforme is like pellagra, in that it is prone to recur, usually is seen in the spring and autumn, and is accompanied by nervous and gastic-intestinal symptoms. It differs from pellagra, in that the eruption is found on the flexor more often than on the extensor surface, and seldom on the face and other parts of the body that have not been subjected to irritants. The eruption as a rule is more edematous than pellagra, usually occurs in patches, and rarely ever involves the entire surface or exfoliation of the epidermis nor pigmentation. The duration of the lesions are usually short, lasting a few days to two or three weeks.

In persons whose vitality is below normal the following erythemata often assumes many of the skin manifestations seen in pellagra. They are erythema caloricum, erythema ab igne and erythema pernio.

An acute erythema caused by extreme heat is usually seen on the face, hands, forearms and legs. It occurs in various shades of redness and may last several days with a burning and itching sensation. After the disappearance of the erythema there often remains a dark brown permanent pigmentation of the exposed area.

In cooks and stokers an erythema from heat is common, and usually occurs on the anterior surface of the legs. The eruption is often inflammatory in character, varying in color from a light to a deep red or purplish tint, with very marked pigmentation.

In persons with a feeble circulation an erythema often occurs on the fingers, toes,

ears and nose, and in some cases extending to the hands and feet.

The eruption varies from a light red to a dusky red shade. It is usually accompanied by tenderness, itching or a burning sensation. When the erythematous area has been exposed to irritating substances it becomes edematous, often spreading to other parts of the body. In some cases the formation of vesicles, bullae and pustules takes place and in exceptional cases ulceration. In some cases the eruption is misleading, especially in those cases in which there is some constitutional disturbance.

The differential diagnosis from these erythemata, from the rash that occurs in pellagra, is as a rule made by history, location, and absence of other symptoms of pellagra.

There is a group of rather uncommon skin diseases that resemble the skin manifestations of pellagra that should be considered. To this group the term "Recurrent Summer Eruptions" has been given. The disease begins usually during childhood on the face, neck, hands, feet and legs. The diseased area is erythematous and at times numerous lesions occur, papular and vesicular in character. In predisposed persons the eruption is produced by the irritating effect of the sun or intense artificial heat. The disease usually occurs during the spring and summer months and bilaterally on the exposed surfaces.

The eruption is generally preceded by a sensation of heat or itching and mild constitutional disturbances. After several attacks of the eruption the skin becomes somewhat thickened and later atrophied and still pigmented.

The differential diagnosis of recurrent summer eruptions can be made from pellagra by the history, age of the patient, character of the eruption, location, shape of the lesion and the absence of other symptoms of pellagra. The rash in recurrent summer eruptions may occur several times in one year.

The eruption of eczema often resembles the skin manifestations of pellagra, especially is this true when it occurs on the face, upper and lower limbs.

Eczema usually begins as an erythematous papulo-vesicular eruption, later becoming edematous, accompanied by more or less itching and burning. After the acute stage subsides it becomes subacute or chronic, followed by infiltration and exfoliation of the epidermis. Of the various forms of eczema the erythematous form is perhaps more frequently mistaken for pellagra than any other.

Erythematous eczema generally begins as macules or erythematous spots with swelling, accompanied by excessive burning and itching. It generally varies from a bright red to a dull or purplish color.

In a few days after the appearance of the eruption desquamation begins, and often continues for several weeks, usually until the disease becomes chronic in character. In the chronic form of erythematous eczema there is generally a sharp line of demarcation with very little tendency to spread; the skin becomes more or less infiltrated, with exfoliation of the epidermis.

In persons who are predisposed to eczema the exposure to intense heat, cold wind and other irritants often will cause an outbreak of the eruption, and the frequency of the occurrence of eczema on the hands, face and feet is due largely to these influences.

Eczema differs from pellagra in that it occurs at all seasons of the year, during the winter with as much frequency as during the summer. In eczema the eruption is not as a rule symmetrically distributed. It is usually seen on the flexor surface as well as the extensor. The edema in eczema is more marked than the rash of pellagra, and is accompanied with more itching and burning, also the scaling and crusting is more pronounced, the line of demarcation is not so pronounced and on resolution there is no atrophy or pigmentation of the skin.

The skin of the hands, wrists and face in old persons is characterized by various changes, more or less thickening of the epidermis with pigmentation and thinning of the derma. The application of irritating substances often causes an erythematous rash that is very chronic in character and could be mistaken for the late skin manifestation seen in old people suffering from pellagra.

In susceptible persons such substances as strong soaps, washing powders, alkalies and acids, poison ivy and poison oak, and many chemical agents used in the different trades irritate the skin causing a dermatitis that often resembles the skin manifestations seen in pellagra.

The skin symptoms in dermatitis venenata are often misleading, perhaps oftener than in almost any other skin disease. The eruption usually begins as a simple erythema with edema, followed by papulo-vesicular, bullous lesions and in some cases pustules and crusts.

The eruption in most cases of the dermatitis is of short duration, lasting only a few days. When the irritation is long continued it usually causes a dermatitis in which the skin may be more or less thickened with a dull red color, covered with fine adherent scales; the normal folds of the skin are deepened, and in some cases form troublesome fissures.

The eruption that is caused from poison ivy and poison oak is usually seen on the hands, wrists, forearms, face, genital organs, feet and legs, and in some cases at other parts of the body. When the eruption is caused from chemicals used in the different trades it isusually confined to the hands, wrists, forearms and in some cases to the face, but like the eruption from poison ivy cases are frequently seen where the eruption extends beyond the irritated area. Especially is this true when the person is suffering from any form of toxemia. In some cases the inflammatory area is sharply defined, limited to the back of the hands, wrists and forearms.

Dermatitis venenata can usually be differentiated from pellagra by history, duration and location of the eruption. Dermatitis venenata usually beginning between the fingers on the wrists and spreads often to parts that are not exposed to the sun, and the inflammatory area usually is not sharply defined as the lesions in pellagra. It occurs in successive outbreaks and other symptoms of pellagra are usually absent.

Ichthyosis (Xeroderma) often assumes many of the skin manifestations seen in the late stages of pellagra.

Ichthyosis is a cutaneous condition that usually begins early in life, characterized by a dry, harsh and scaly condition of the skin. The disease is divided into several varieties according to its severity, but the only variety that is of interest in connection with pellagra is ichthyosis simplex or Xerodermia.

In Xeroderma the skin is dry, rough, with slight exfoliation of the epidermis, destitute of the natural moisture and oil. The affected area is usually limited to the hands, the extensor surfaces of the forearms, to the legs and in some cases to the face and neck.

The color of the skin in most cases is of a dirty, yellowish or brownish hue.

The ichthyotic skin is very sensitive to any irritating substance; the application of any irritating agent may produce a dermatitis. A mild form of dermatitis often occurs after exposure to cold wind or extreme heat. Ichthyosis and its complications can usually be differentiated from pellagra by history, location, season of the year and the absence of other symptoms of pellagra. Ichthyosis is usually worse during the winter. The eruption is rarely ever sharply defined. In most cases it gradually merges into the healthy skin.

The desseminated form of lupus erythema-

tosus often resembles some of the stages of the skin manifestations of pellagra. Lupus usually begins on the face about the nose, cheeks, ears, often extending to the scalp, hands, the body, and in some cases becomes almost universal.

In most cases of disseminated lupus, the borders of the lesions are well defined with infiltrated edges.

The eruption usually begins as a small descrete hyperemic spot or patch, gradually spreading. Later the lesions coalese, forming large patches, and in some cases involving large areas in a very short time.

After the acute stages of disease disappear the area becomes thickened, often followed by exfoliation of the epidermis. The eruption is often complicated by vesicular, papular and bullous lesions, and in some cases pustules.

The lesions of lupus are a deep purplish red in color. Most cases pursue an acute course, with burning, itching, pain in limbs, fever, and often gastro-intestinal symptoms.

Lupus erythematous disseminatus can usually be distinguished from pellagra by the location, shape, time of the occurrence of the rash, color, course, duration and the absence of other symptoms of pellagra.

Erysipeloid and erysipelas perstans faciei are two rare skin diseases that have some of the characteristics of pellagra and should always be kept in mind in making the differential diagnosis.

Erysipelas perstans faciei, as its name indicates, occurs on the face, but it may spread to other parts of the body, and sometimes occurs on the hands.

The eruption begins in multiple patches bilaterally, spreading very rapidly, often involving the entire face. In some cases papples and purpuric lesions may be present. They are most often seen when the hands are involved. The eruption in the beginning has a bright red color but soon becomes deep, dusky red or a bluish red.

Erysipeloid is found in persons who handle decayed flesh. The infection gets into the skin through abrasions, cracks, etc. The disease usually begins on the fingers about the joints and knuckles, and often spreads very rapidly all over the hands, and sometimes extends to the forearms.

The edges usually are sharply defined. As the lesion spreads the central portion begins to subside. It usually occurs on one hand, but may be seen on both. The disease persists usually from three days to three weeks.

Erysipeloid can usually be differentiated from pellagra very readily by the history of the eruption beginning in a crack or fissure, the occupation and the character of the lesion. Erysipeloid generally occurs unilaterally, and involves both surfaces of the arm.

Erysipelas perstans faciei can de differentiated from pellagra by the rarity of the disease; occurs at all seasons, generally confined to the face, and other symptoms of pellagra are absent.

Syphilis is frequently called the great imitator, as at times its lesions resemble the lesions of practically all other skin lesions, and pellagra is not an exception to the rule. However, would say that syphilis is not as likely to be mistaken for pellagra as are many of the other conditions that I have discussed. When syphilitic lesions occur on the hands and face they are usually discrete, but occasionally the lesions fuse and spread all over the surface.

Syphilitic eruptions can usually be differentiated from pellagra by the history of a primary lesion, the secondary rash on the body, character of the eruption, a positive Wassermann reaction, and other symptoms of syphilis.

When syphilis occurs on the face it is usually complicated with seborrhoeic dermatitis, often has the distribution of the rash seen in pellagra, and these lesions are not typical of syphilis or seborrhoeic dermatitis.

The skin is duller red in color, with the

formation in most cases of fine greasy scales. In conclusion: Many of the diseases that I have discussed in connection with pellagra are rare, but that is no reason why they should not be considered in the differential diagnosis of pellagra from other skin diseases.

Pellagra is no longer confined to any one section. It is becoming a universal disease, nor is it limited to particular seasons, but is occasionally seen during the winter months.

The skin manifestations are the most important symptoms in the diagnosis of pellagra. Mouth symptoms cannot be depended on since stomatitis is due to many other causes. Intestinal troubles are not to be entirely relied on, since amebic dysentery and tubercular enteritis may be the cause. Neurologic symptoms alone are not sufficient, since many of them are due to syphilis.

There are very few known diseases in which depression and gastro-intestinal symptoms are not at times present. In suspected cases of pellagra all other diseases should be excluded. Mistakes made in a failure to distinguish other dermatoses from pellagra are to be censured. On the correct diagnosis often depends the welfare if not the life of the patient, as well as those with whom he may associate.

In presenting this subject it is my desire to encourage a more exact observation of the skin manifestations simulating pellagra.

Suite 929 Candler Bldg.

PELLAGRA—ITS AETIOLOGY AND TREATMENT.

By W. E. Deeks, M.A., M.D.,
General Superintendent, Medical Department, United Fruit Co.,
New York, N. Y.

There is no medical subject today possessing a greater interest in the Southern states than that of pellagra. Thousands are afflicted and the death toll is tremendous.

The recent publication of Dr. Goldberger, bearing on its aetiology and cure, has awakened a new interest, and it is in this connection that I wish to bring my own experiences again before the physicians who are interested in its aetiology and treatment.

As Chief of Medical Clinic at Ancon Hospital, Panama, my interest in the disease began on June 16, 1910, by the admission of a typical case which rapidly proved fatal. This was followed by another in July of the same year, also proving fatal. A third case was admitted on June 4, 1911, dying five days subsequently. All of these cases were posted and the multiplicity of the pathological lesions were such that the cause of death was put down as general septicaemia with infection of undetermined origin.

On March 23, 1912, the author published in the "Medical Record," of New York, an article entitled "Pellagra in the Canal Zone," in which twelve cases were reported, and also the treatment, from which the following is abstracted:

"I believe that it is not corn alone, but any cereal or stach food in conjunction with cane sugar, in a warm climate, where there is lessened metabolic activity, and consequent inadequate elaboration of digestive elements, which initiates the autointoxication responsible for the symptom-complex known as pellagra. The proof thereof lies not in the determination of the elusive complex physicochemical substances, the result of fermentation or defective metabolic elaboration, but in the results obtained by physiological treatment based on the above-mentioned hypothesis.

"Treatment: This consists (1) in limiting the nourishment absolutely to fresh fruit juice, preferably orange, meat broths, and milk, as long as there is nausea or vomiting, and the absolute avoidance of everything which contains sweet or starchy elements; (2) in the administration of from 15 to 30 drops of dilute nitric acid in three-fourths of a tumbler of water three times daily on an empty stomach. When the stomach condition improves, which is generally in three or four days, a carbohydrate-free diet is ordered. This consists, in addition to the above, of eggs, meat of all kinds, fish, green vegetables, such as lettuce, celery, onions, tomatoes, beets, carrots, spinach, chayoti, vegetable marrow, okra, green

peas, string beans, egg plant, etc., and fresh fruits of all kinds, there being no limitation."

At the second triennial meeting of the National Association for the study of Pellagra, held at Columbus, S. C., October 3-4, 1912, the writer read a paper on the same subject—its aetiology and treatment—in which come cases were reported and the symptoms were detailed. At the conclusion of the article the same treatment was summarized as quoted above.

From the above consideration one can readily see that Dr. Goldberger has done a valuable work in producing the disease by feeding patients on the foodstuffs that the author of this article had years before indicated as the undoubted cause of the disease. The writer has a great deal of clinical material proving that this theory is probably correct.

In any case, the chief object of the physician is to prevent disease, and to know how to cure it if it develops. The author has been treating pellagra along the lines above indicated with brilliant results since July 25, 1911. That this method is also successful when carried on by others is shown by a pamphlet in my possession by Dr. Yarborough, of Columbia, Alabama, who had eighty-one successful cases to his credit up to January 6th, and who has established a hospital there for the treatment of cases after the method outlined by the author.

17 *Battery Place.*

OBSERVATIONS ON FORTY-SIX CONSECUTIVE CASES OF PELLAGRA TREATED WITH CACODYLATE OF SODIUM.

By B. H. Booth, M.D.,
Drew, Miss.

About the middle of 1914 I commenced treating pellagra with intra-muscular injections of cacodylate of sodium, using no other medicine whatever. Neither did I make any change in the diet, work or environments—simply gave adults an injection deep into the muscular tissues about seven grains about once a week, children in proportion. I treated 16 cases in 1914 and 30 in 1915, with this method with only one death. All of the others are apparently well at this time, so far as I can ascertain. All of the sixteen treated in 1914 have been seen some time this winter and not one has had any symptoms of a return. It seems to me that if diet alone is the cause of the disease these patients would not have recovered so easily. I believe that the disease is caused by a mildly infectious organism, probably brought to our country by Italian immigrants. Of course, diet is a predisposing cause, for if the body is well nourished it is able to throw off the infection, but if the diet is not well balanced the body is badly nourished, the infection plus the unbalanced diet gives us pellagra. I acknowledge that probably some cases will get well on a well balanced diet without any medicine whatever, but so will some other diseases. We may all of us be carrying the organism about with us something like we do the pneumococcus, and when the unbalanced diet reduces the bodily resistance the organism takes hold and overcomes the patient, resulting in the disease. Then if the diet is changed and the bodily resistance built up the patient may overcome the disease without any medicine. It seems to me that this is the only thing that we can conclude from Goldberger's experiments. As to the treatment advocated in this paper, I do not know whether the cacodylate of sodium acts directly on the organism, or simply promotes nutrition so that the body is able to overcome the infection; but I believe that it acts both ways, for the improvement is so manifest and rapid that in my hands it seems almost a specific. I believe that the reason some of those reporting its use do not have as good results

is because the dose is too large and given too often. I do not claim that any of these cases are permanently cured, but all symptoms of the disease have disappeared and they are clinically well. I believe that if any of them do have a recurrence of the disease that it can again be clinically cured by the same treatment.

All but three of these cases were among negroes, whose diet is practically the same that it has been for the past twenty or thirty years. We have only had pellagra for the last few years, which seems to be entirely inconsistent with the theory that diet alone is responsible for it.

AUTHORS' ABSTRACTS.

Medicine.

The Onset of General Paralysis. By Charles Ricksher, Kankakee, Ill. Johns Hopkins Hospital Bulletin, May, 1915, pp. 174-178.

General paralysis is a disorder which must be recognized before definite organic changes have taken place in the nerve cells and fibres if any success is to be acquired in treating it. The trouble may be localized to certain areas or to one hemisphere, and the clinical picture differs according to the severity and localization of the lesion and to the intensity of the causal toxin, as well as to the mental makeup of the individual.

The physical signs are usually emphasized in accounts of the disorder and classifications are generally based on the presence of these signs. There is no pathognomonic mental picture, but it must be recognized that the mental symptoms may precede the physical signs, and may mask them to a certain extent.

Two cases are given illustrating the fact that mental symptoms may occur without definite physical signs sufficient to warrant a diagnosis. A third case is mentioned which raises the question whether mental attacks in syphilitics may not occur as definite prodromal outbreaks of general paralysis.

As syphilis may simulate any physical disorder, so may general paralysis simulate any mental disorder, and consequently every means of diagnosis, clinical and laboratory, must be used to make an early diagnosis.

Widal Reactions Among Healthy Adult Filipinos. By David G. Willets, U.S.P.H.S., Manila, P. I., *Philippine Journal of Science,* June, 1914, pp. 253-257.

These tests were made on the blood of 300 apparently healthy, young, adult Filipino employes (nurses, etc.) of the Philippine General Hospital, the object being to determine the percentage indicating previous or present infection with *Bacillus typhosus* by the presence of a positive Widal reaction. Serum only was used and the microscopic test was performed. From 15 to 30 tests were made at a time and the results were checked against reactions on the blood of known cases of clinical typhoid fever. Satisfactory control reactions were made in a number of instances about ten days after the original tests.

Noteworthy agglutination and loss of motility were present in 16.1 per cent, and this was of such a degree as to be considered definitely positive in 4 per cent of the cases.

Of cases diagnosed as typhoid fever during the year preceding this investigation, the clinical diagnosis was verified by positive blood cultures in eight cases; by anatomical lesions at autopsy in nine cases, and by both positive blood cultures and anatomical lesions in autopsy in five cases. Widal reactions, performed in a manner similar to those upon the blood of the healthy adults, except for minor differences, were positive in twenty, or 90.0 per cent of these twenty-two cases. Only one Widal test was made of the blood of each of the two negative cases. These findings seem to justify the belief that the complete reactions among the healthy adults indicated an antecedent or a coincident infection with *Bacillus typhosus.*

Tertiary Syphilis of the Liver. By Thomas McCrae, Philadelphia, Pa. Johns Hopkins Hospital Bulletin, May, 1915, pp. 144-146.

This paper is based on a study or 70 cases and emphasis is placed on the frequency, usual ease of recognition, and good results if therapy is begun early. The condition is particularly common in the colored race. Excessive use of alcohol appears to be a predisposing factor. Loss of weight, fever and chills were among the general manifestations. Abdominal swelling and pain were common. Ascites is frequent, often chronic, may vary remarkably and sometimes subsides without tapping. Jaundice occurred in half the series and fever in nearly all. The changes in the liver were of three kinds: (1) A general enlargement, usually smooth; (2) nodular enlargement, and (3) large, smooth, rounded prominences. Early diagnosis is particularly important and the frequency of fever and loss of weight should be remembered. Some patients were thought to have tuberculosis. The ascites and presence of nodular masses may suggest carcinoma or tuberculous peritonitis. From the special hepatic features, cirrhosis and cholelithiasis may be suggested. One important point is that the left lobe of the liver is often relatively more enlarged than the right lobe. It is important to examine the patient immediately after a tapping. The finding of a positive Wassermann reaction and the therapeutic test are of value. Potassium iodide is the most important means of treatment for the hepatic changes. Mercury and salvarsan should also be given.

TROPICAL DISEASES AND PUBLIC HEALTH

THE SMALL TOWN—THE NEGLECTED UNIT IN SANITARY ADMINISTRATION.*

By A. W. Freeman, M.D.,
Epidemiologist, U. S. Public Health Service.
Washington, D. C.

There is at this time in the minds of a majority of the American people no question as to the necessity and desirability of most of the procedures advocated by sanitarians. The stage of propaganda is rapidly passing and must be succeeded by the stage of performance. This performance, if we are to satisfy the people, must be efficient, economical and successful. The great need of sanitation in the United States at this time, therefore, is neither agitation nor investigation. It is a need for organization and administration. No one would contend that any state has at this time a comprehensive and satisfactory health organization which gives to every citizen the protection against disease and premature death to which he is entitled. Most cities have more or less satisfactory organizations, in some counties health organization is rapidly reaching a state of efficient and successful operation.

There is one administrative unit, however, which up to this time has been almost completely overlooked by sanitarians and to which we would draw especial attention at this time. This is the small town in the rural districts. There are thousands of such towns scattered throughout the rich agricultural districts of the Middle West, ranging in population from 100 to 1,000 or more. Such a town is essentially a group of country homes without the intervening farm land. Its population is essentially a rural population, people one step removed from the farm, many of them retired farmers, or still owning farm land.

The sanitary problems of such a town are the problems of the individual farm, intensified by the density of the population. Their sanitary needs are almost all inclusive since at the present time only the most rudimentary forms of sanitary control are exercised. These needs are exceedingly difficult to meet. The people of such towns still have the individualistic point of view of the farmer. They have no experience in communism and the natural tendency of each man is to meet his sanitary needs for himself rather than to attack the whole problem as a community. In addition to this psychological difficulty, and it is a very real one, the small town presents another difficulty in the size of its administrative unit. Many of the problems it presents can be solved only by trained service and the average small town can afford neither sufficient work nor sufficient compensation to attract such service. The small town can ill afford the services of sanitarian, engineer or even of a scavenger, and for lack of trained service suffers acordingly.

The primary and fundamental sanitary needs of the small town, like any other inhabited community, are those of water supply and excreta disposal. Neither is easy of solution. The usual experience is to find the inhabitants of a small town depending on open surface privies and shallow wells, attached to the individual home in exactly the same way as at a farm home in the open country.

It is not difficult to secure an adequate and satisfactory supply of water on the average farm under ordinary conditions. There is available sufficient space for a thorough separation of well and privy, and with proper protection of the well top a reasonably safe water may be assured. Concen-

*Chairman's address, Section on Public Health, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas, November 8-11, 1915.

trate the population into the limits of the small town, however, and the matter at once complicates itself. The high price of land throughout the Middle West has made the towns build closely over small areas and satisfactory separation of well and privy on the average lot in the small town is out of the question. In general it may be said that the lot in the small town may be used with safety either for disposal of excreta or for furnishing a supply of water, but never for both.

Under the usual conditions, therefore, the individual private well in the small town is dangerous. It is practically always located too close to sources of soil pollution, and is frequently not provided with proper protection around the top. The cost of individual wells, with the cost of maintenance and of private pumping plants is probably not much less than the cost of a public water supply for the small town as a whole. Individual effort in this direction cannot be much more efficient than community effort.

While it is true that most small towns can afford a public water supply and should by all means have such a supply, it does not follow that such a supply is easy to obtain. The psychological element enters profoundly into the problem. It seems to be the habit of the average American to separate definitely in his mind expenditures for public purposes from his private expenditures. He has a constitutional aversion to taxes and poor discrimination between the various purposes for which tax money is spent. It is hard to make him realize that selling bonds and furnishing water is exactly the same as taking stock in a corporation to do a legitimate and usually profitable business. Even the argument that the water system will pay for itself in a few years in reduced fire insurance rates frequently fails to reach him.

Even where the citizens of a town are convinced of the necessity for a water system and want it installed, the difficulties of the town have just begun. They need at this juncture the very best of engineering advice as to the source of supply, the layout of the distributing system, the location of fire hydrants and, above all else, the choice of an engineer and the probable cost. Such advice they are not liable to get unless furnished by the state through its department of health or of engineering at the state university.

Sources of public supply for the small town are not always easy to secure. Shallow wells are seldom of sufficient capacity, suitable sites for impounding reservoirs are exceedingly rare, and the filtration plant in small units is too expensive to install and operate to make its use by towns of the size in question desirable. The deep well is fortunately usually available as a source of supply, and provided the water is not too hard, usually furnishes a satisfactory and ample supply. Where the public supply is hard or otherwise undesirable, many citizens will continue to use private wells, and one of the main purposes of the public supply will thus be defeated. Public sentiment is still a long way from permitting the forcible closure of private wells where a public supply is available.

In those cases where the bonding limit or other reasons make the installation of a public supply out of the question, and where the private well must continue to be the source of supply for the town, recourse must be had to means of preventing soil pollution and thus preserving the purity of underground waters in the town.

The second prime necessity is for proper disposal of excreta. This is beyond question the most difficult of the sanitary problems confronting the citizens of the small town. Present conditions are almost without exception insanitary in the extreme, as well as uncomfortable, inconvenient and offensive. It is not too much to say that the excreta disposal of the average small town has not improved since the stone age. Moses, in his writings, provided that the children of

Israel select a place without the camp to which they should repair and where the excreta should be buried as deposited. In the average small town the burial takes place within the limits of the town instead of without, and at long intervals instead of day by day. These changes can hardly be considered as improvements.

It is, of course, evident that the only sanitary, convenient, permanent and really satisfactory system of excreta disposal for any thickly settled community, whatever its size, is by water carriage of sewage. This fact, however, has but recently been impressed on the cities of the United States, and is still far from general belief in the small towns. Much progress has been made, and good progress is being made, but at the present time the very large majority of the small towns still depend upon the outdoor dry closet. The average town privy, like the town well, is the farm privy moved to town.

It must be confessed with shame that, notwithstanding the very large amount of attention which has been given to the matter of excreta disposal within the past few years, we are still without a type of privy which is even approximately satisfactory for individual use. The best we can do at the present time is provide a receptacle for the material, and protect it against dissemination by flies, domesticated animals and other agencies until it can be removed and disposed of in some distant place. The fermenting or liquefying privies carry the process one step further, and by liquefying the sold matter and reducing the volume of material by evaporation, simplify the matter of final disposal, but no type of privy now known, suitable for use in a small town, depending on shallow wells for its water supply, really finally and satisfactorily disposes of human excreta.

For the average small town, however, is available a system, which depends upon uniformity of construction and community operation for success, but which in actual practice is sanitary, workable and satisfactory. This is the so-called can privy, with a regular system of cleaning by a public scavenger. The essentials of any system for town use are that the pollution of the soil is prevented, that access of flies and animals to the excreta be denied, that cleaning be easy and convenient, and that the privy contents be regularly removed and carried beyond the limits of the town for final disposal.

To install this system in a town requires the passage of an ordinance forbidding the construction, maintenance, or use of any privy within the limits of the town, unless the privy is provided with watertight receptacles, preferably of metal, under each seat, of suitable capacity, usually about one bushel; that the contents be protected against the access of flies or domesticated animals; and arranged for convenient and cleanly removal by the scavenger. The cost of reconstructing the average privy in accordance with this ordinance will be in the neighborhood of two and half dollars per family. Along with the privy ordinance the town must make contract with some individual to clean all privies regularly, usually twice each month, and to remove the material in covered metal watertight cans to the disposal ground for burial. The disposal ground is usually readily obtained free, on account of the high manurial value of the material, and should be, as far as possible, from any human habitation and from any water supply. The cost of cleaning will be in the neighborhood of 30 cents per month per family. The total cost of reconstruction and cleaning for the year will be but little if any more than the amount paid by the average householder for the cleaning of the vault privy once a year, or for digging a new pit and moving the privy house.

This system offers to the small town a fairly satisfactory solution of the difficulty, and if properly kept up is sanitary and inoffensive. That it is not more generally in use is due to the fact that most towns have never taken up the matter of refuse disposal in a serious manner, relying on the individual citizen to attend to the matter for

himself, and that the organization of the system is a matter requiring a good deal of work and arousing some opposition from the ignorant or parsimonious part of the citizenry.

The pit privy, so generally in use in the United States, and in some communities in almost universal use, offers a problem in itself. It can be, without difficulty, rendered free from all dangers except those of polluting underground water. Just how great a danger this is we are not at present prepared to say. The bacteriological evidence as to the distance through the earth which infectious organisms will penetrate is neither concordant nor convincing. There is apparently the widest difference between soils. There is no doubt that in certain loose soils, and in certain wet soils, particularly where there are decaying tree roots and crawfish burrows, infection will penetrate considerable distances through the soil. There is, on the other hand, no doubt that certain soils are exceedingly good filters. The difficulty lies in discriminating between the conditions, and this can be done only after extensive bacteriological investigations. For this reason the pit privy must be looked on with grave suspicion until proved safe for any given location, and as it offers no particular advantage, except freedom from the necessity for frequent cleaning, it cannot be regarded as a desirable type of privy for town use under any conditions.

The installation of a proper system of privies, with regular and systematic cleaning, is an exceedingly practical and common sense method of meeting the situation. Where pollution of the soil with human excreta is absolutely prevented in this manner, the matter of securing good water from shallow wells is much simplified.

No system of privies, however perfect their construction and operation, however, can be considered as more than a temporary makeshift. Every town must look forward to the installation of a complete sewer system to which every house must be connected. To bring this about in a small town is not impossible or even very difficult. It cannot be done by a day's work or an evening's public lecture. It requires tact, diplomacy, persistence and above all patience. The idea must be planted, watered and nursed to fruition. The development of a proper sentiment for a sewer system should be undertaken, if possible, in advance of the construction of any considerable number of private disposal plants, since these are usually constructed by the more progressive and well-to-do of the citizens, and once provided with a satisfactory private system these persons are not anxious to bear their part of the cost of a public system.

The town seeking to install a sewer system, however, is early confronted with the question as to how to dispose of the sewage. State laws in many states prohibit the discharge of crude sewage into the streams. While this is undoubtedly necessary in some cases, by reason of the fact that many streams have so low a dry water flow as to make crude sewage a nuisance in the dry months, in many cases these regulations are in behalf of preserving the so-called "pristine purity" of the stream. There is a very serious question in the minds of many sanitarians as to whether this so-called "pristine purity" is worth preserving. The time has long gone when the water of any large stream in the United States is fit for domestic use without thorough purification. Most of our large streams already receive so much sewage from the larger cities that the addition of the small amounts from the towns would have no appreciable effect on the total. These regulations seem particularly unreasonable to the small town, as the cities, having constructed their sewer systems years before, have acquired an easement and continue to discharge the raw sewage, while the small town, even if located below the city on the same stream, must construct expensive purification works to purify a small amount of sewage.

In the smaller streams it does not seem

just or expedient, whether or not it be lawful, that the riparian owner, desiring to pasture a few cattle on the stream, should be permitted to force the town to spend thousands of dollars for a plant and heavy expenses of operation to preserve the stream from pollution. The sewering of the small town will have a profound effect on the health of the whole people. The small town is the chief sanitary offender at the present time, and to hamper its efforts at improvement to preserve a purity which does not exist in the streams, is unwise to say the least.

Even if the town has every desire to comply with the law and is willing to purify its sewage, its difficulties have just begun. Sewage purification is in a far from satisfactory state at the present time. Really satisfactory plants are few and far between. The ordinary civil engineer likely to be consulted by the authorities of a small town is wholly unable to design a satisfactory plant. Every state department of health should be in position to furnish preliminary estimates to the small town and should have full authority to review plans and specifications. Such revision should be with a full appreciation of the difficulties and financial limitations of the town administration, and a deep-seated conviction of the necessity for securing sewerage for the town. Regulation should be based as much on common sense and practical sanitation, and as little on academic considerations as possible.

The disposal of garbage and domestic wastes, other than sewage, is as much a problem to the dweller on a small lot in a country town as to the householder in the large city. Most towns have no provision whatever for meeting this need, and all sort of makeshift attempts are seen. Some are ingenious, some even ludicrous. Where the scavenger system is in use for the removal of excreta, it is not difficult to arrange for collection and disposal of garbage on the same plan. Burial or feeding to hogs are the two methods of final disposal available, and both depend for successful operation on rigid separation of organic from inorganic waste. Where feeding to hogs is a feasible proposition, it is sometimes possible to secure free removal of the garbage for the sake of the food value of the material. This should, however, always be by contract under bond with the town, so that the work will be done with system and regularity and some responsibility to insure its being so done.

It will be seen, therefore, that the small town presents, in the fundamentals of sanitation, problems as pressing and important as those of the city of the first-class. Their solution requires a high degree of technical skill and engineering knowledge. This service they are not likely to get unless it is furnished by the state. The total number of people involved in any one unit is small, the expenditure inconsiderable. In the aggregate the total of the population of the small towns is no small fraction of the population of the state, and the engineering expenditures will total very large sums.

In the second class of sanitary problems, the small town also presents interesting and important features. The control of contagious diseases is for the most part a minor matter, a few cases a year, requiring only the routine procedures of quarantine and isolation. Occasionally, however, extraordinary conditions arise, a typhoid outbreak or the sudden occurrence of a number of cases of diphtheria in the school. Trained sanitary assistance is needed and needed promptly. In such a case, in the absence of a trained county health officer, the town can turn only to the State Board of Health, and should be taught to seek advice at once. The prettiest pieces of epidemiological research and the most striking results of sanitary administration are frequently to be seen in these small town outbreaks.

For supervision of foods, particularly milk, also, the town has a very pressing need. The small town dairy, while no worse than the city dairy of ten years ago, and no

worse than the uninspected dairy anywhere, is by modern standards woefully in need of improvement. This improvement cannot come as a result of the work of a local physician, or other local health officer. The inspection of dairies is, in itself, a profession, requiring special aptitude and experience. For this service the town has at present only the half-hearted, occasional visit of the state inspector. It should have periodic visits, at not too long intervals, of a trained inspector. The small town dairyman is amenable to reason and suggestion, and with a little help will make almost magical improvements. This will not come until the state realizes its responsibility for doing the work.

It will be seen, therefore, that in these fundamentals, as well as in all other phases of sanitary endeavor, the small town presents sanitary problems of enormous extent and of the highest importance. It will be seen also that the town is at present almost helpless to meet most of its pressing needs without the aid either of the state or the county. The coming of the county health officer, as a thoroughly trained sanitarian, giving his whole time to the work, is apparently some time in the future. In the meantime the small towns wait. Their intentions are for the most part excellent. They desire, in the same way as their city brothers, the best of health conditions. They most, under present conditions, look to the state for help.

That it is possible to meet the needs of the small towns in a fairly satisfactory manner, to improve their conditions, and to stimulate their activities, is a fact well known to all who have worked with them. When we have really realized the importance of the problem they present, and have perfected in our state health organization a system to meet their needs, then will the small town begin to come into its own. The small town is today the neglected unit in sanitary administration.

THE EFFECT THAT THE SANITARY WORK ACCOMPLISHED IN CUBA AND IN PANAMA HAS HAD, AND WILL HAVE, UPON THE SANITATION OF THE TROPICS.*

By W. C. Gorgas, M.D.
Major-General, U. S. A.,
Washington, D. C.

In the year 1900 both the science and art of tropical sanitation stood in about the same position of backwoodness which they had occupied during the previous century. During the previous one hundred years very little advance had been made by sanitarians in the control of tropical diseases. About this time two sets of discoveries were made and announced to the world, which have revolutionized tropical sanitation and greatly advanced the ability of the sanitarian to control tropical diseases. Ronald Ross and his co-workers discovered and announced to the world that malaria was conveyed from man to man by the female of the anopheles mosquito. It was established that the mosquito of this species lays her eggs in fresh water; that in about three days these eggs hatch into the larvae; that the larvae lead an aquatic life for about nine or ten days, and at the end of this time they develop into the adult mosquito; that these adult mosquitoes, when biting a human being suffering from malaria, swallow the malarial parasite in the meal of blood which it extracts from the bitten human host. This parasite in the mosquito undergoes a cycle of development which reaches its culmination in ten or twelve days. That after this period, whenever she bites another human being, she injects into the circulation of this person the malarial parasite which causes malarial fever in the person bitten. Malarial fever, in nature, is transferred from

*Address before the Vermont State Medical Society, Burlington, Vt., October 14, 1915.

man to man in no other way. Reed and his co-workers, about the same time, discovered and announced to the world that yellow fever was transferred from man to man by the bite of the female stegomyia mosquito. The life history of the stegomyia, for practical purposes, is the same as that of the anopheles, though the life history of the yellow fever parasite differs somewhat from the life history of the malarial parasite. They discovered and announced that the yellow fever parasite only lives in the blood of the sick man during the first three days of his sickness. The female stegomyia, therefore, to become infected, has to bite during this period. That the yellow fever parasite requires from twelve to twenty days for his cycle of development in the mosquito. That after this period, when she bites a non-immune human being, yellow fever will follow in this person in from three to six days.

In the two histories just given of the malarial and yellow fever parasite, I wish to call your attention to two very important differences in the life histories of the two parasites under consideration. These differences play a very important part in the practical sanitation of the two diseases caused by these two parasites. The two points which I wish to emphasize are these: The malarial parasite remains in the blood of the infected person for an indefinite period, sometimes for several years. An individual, therefore, suffering from malaria is a possible source of infection for a long time. The yellow fever parasite remains in the blood of the human being infected with yellow fever for only three days. The yellow fever patient, therefore, is a source of possible infection to the stegomyia mosquito for only this length of time.

The second point is this—that almost any human being bitten by the infected anopheles mosquito will contract malaria; only the non-immune, when bitten by the infected stegomyia mosquito, will develop yellow fever.

These two points have caused the spread of yellow fever over the earth's surface to have been much less wide and extensive than the spread of malaria and have caused the sanitary measures taken against these two diseases to be much more prompt and spectacular in their results in regard to yellow fever than in regard to malarial fever.

Another point in the life histories of the two species of mosquitoes under consideration has tended to limit the spread of yellow fever to very much narrower limits than the limits which apply to malaria, *i. e.*, the fact that the stegomyia is much more susceptible to the effect of cold than is the anopheles. The endemic area, therefore, of yellow fever has been entirely confined to the tropics.

With this knowledge furnished by these two sets of workers, the sanitary authorities of the City of Havana originated and applied sanitary measures which entirely eliminated these two diseases from this city. All during the nineteenth century Havana has been the focus from which yellow fever has constantly spread to the United States and to the other parts of the Northern hemisphere affected by yellow fever. For one hundred and fifty years before this time there had been yearly in Havana from three to four hundred deaths from this disease, and never within that time had a month passed without a death from yellow fever in Havana, or a single day in which there had not been a case of yellow fever within its limits. The anti-mosquito work was commenced in Havana in February, 1901. In September of that year the last case of yellow fever occurred. Since this time Havana has ceased to be a focus of infection, and yellow fever has practically disappeared from the earth's northern hemisphere. The measures which were worked out for the control of the anopheles mosquito, and thereby for the elimination of malaria, bore a very great similarity to the measures used against yellow fever, as would be expected from the similarity in the life histories of the two

mosquitoes concerned, and the similarity in the life histories of the parasites causing the two diseases. As was to be expected from the differences in the life histories of the malarial and yellow fever parasites, the results following the malarial work were not as prompt as the results following the yellow fever work, though, in the long run, both sets of measures were equally effective. In the course of a few years malaria was entirely stamped out in Havana. In 1904 the United States undertook the construction of the canal at the Isthmus of Panama. The history of Panama for malaria and yellow fever for the 400 years previous to our taking charge had even been worse than that of Havana. The sanitary measures originated and worked out by the Sanitary Department of Havana were put into effect at Panama. The results were equally striking.

Many of the men who had been employed in the Sanitary Department of Havana were transferred to Panama. We commenced work at Panama in May, 1904. The last case of yellow fever occurred in Panama City in November, 1905.

In 1906 our malarial rate was at its height on the Isthmus. During that year we admitted to the hospital for malarial fever 821 out of every 1,000 of our employes. In 1913 we admitted only 76 from the same number of employes.

Practical measures of sanitation against malaria and yellow fever worked out at Havana have since that time been applied at many other places, and yellow fever and malaria, by means of these measures, have been eradicated at many other places other than Havana and Panama. Sanitarians everywhere now accept these measures as the proper procedure for the attempted control of these two diseases. The work which freed Havana from yellow fever between the months of February and September, both included, cost the Sanitary Department of Havana about $200,000, or 80 cents per capita—less than four-tenths of a cent per day per capita. The cost of the sanitary work at Panama was about $350,000 per year, or, approximately, one cent per day per capita. It cost us nearly three times as much at Panama as it did at Havana. The difference was due to the different methods of administration pursued at the two places. There is no essential reason why the work should not have been done as cheaply at Panama as at Havana. But either cost could be well borne by any community undertaking the eradication of these two diseases. Several writers have stated, concerning sanitation on the Isthmus, that it cost about $20,000,000, about 5 per cent of the total cost of the canal. The truth is that it cost, during the ten years of construction, about three and one-half millions, or about 1 per cent of the total cost of the canal. Some writers have made this error honestly, led thereto by official publications which give the cost of the Sanitary Department at about twenty million dollars. But the expense of the Sanitary Department covered many things besides sanitation, such as care of the sick, which cost us some ten or twelve million dollars; salaries of the ministers of the various religious bodies; undertaking establishments; care of cemeteries; burial of the dead, and many other items amounting to four or five million dollars, which in no way pertained to sanitation.

I think it is important to make this very clear: that the expense of sanitation at Havana and at Panama was not high, and that such expense could well be borne by any community seeking to free itself from these two diseases. As stated before, the expenses of sanitation at Panama were unnecessarily expensive, due to methods of administration, over which the Sanitary Department had no control. At Havana the Sanitary Department had entire control of its administrative methods, and there the per capita cost of getting rid of yellow fever was less than four-tenths of 1 per cent per day per capita, as compared with ten-tenths at Panama.

This question of sanitary expense has recently been called to my attention by an editorial in the New York *Sun* of September 30, which editorial rather ridiculed the idea of anything like National work looking toward mosquito extermination, on account of the prohibitive expense, as illustrated by the work at Panama. The writer no doubt had in mind the twenty million dollars expended by the Sanitary Department at Panama, rather than the three and one-half million expended on sanitation.

Sanitarians generally have not found the methods employed in Havana and Panama expensive, and a great deal of useful work has been done in many parts of the world along these lines.

I should like today to dwell upon the fact that the sanitary work accomplished in Havana and Panama, as time goes on, will not be looked upon as having accomplished the greatest good in the local benefits conferred. But I hope and believe that in future generations its reputation will rest upon the fact that it was the first demonstration that the white man could live, work and thrive just as successfully in the tropics as he now does in the temperate zones. When the knowledge becomes general that the white farmer can settle in the tropics and can carry on farming operations with just as little risk to health as he now does in Canada, the white man will seek the lands as a home. When it is also known that the cost of caring for his health in the Amazon Valley is not as great as the cost of protecting himself against cold in Manitoba, the Amazon Valley will attract great numbers of people now living in the United States and Europe. Such emigration will have the same effect that the emigration due to the settlement of America had upon Europe, *i. e.*, a considerable increase in the wages of those left behind. Such increase in wages, I feel quite confident, will do more to improve the sanitation of Europe and the United States than did our special measures at Havana and Panama toward improving local sanitation. I like to think that the great good accomplished in tropical sanitation wihin the last twenty years is only a beginning; that the greatest results are still to come, viz., that of the increase of wages all over the world, and a resultant general improvement in sanitation, due to the throwing open of the tropics to settlement by the white man.

THE SEX QUESTION IN PUBLIC HEALTH.*

By Isadore Dyer, Ph.B., M.D.,
Editor N. O. Medical and Surgical Journal;
Editor American Journal of Tropical Diseases and Preventive Medicine, etc.,
New Orleans, Louisiana.

Perhaps the title of this paper appears meretricious in that the usually accepted lines of public health are well defined. The progress of public health, however, along new avenues of practice in the past few years has opened up many opportunities of service, and as time goes on these must increase.

The general scope of public health contemplates the preservation of the community in the full enjoyment of health and in aiming at this those who administer the rules and laws related to the public health have expanded their usefulness from a mere perfunctory exercise of office so as to include the care of all those things which purvey to the public welfare, which embrace foods and drugs, the regulation of environment and the proper safeguards against contagious diseases. The school and its purposes fall within the protection of the public health authority, and even the home must obey certain laws of practice, so far as the school child is concerned.

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*Read in Section on Public Health, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas, November 8-11, 1915.

In weighing responsibilities the health official must often take the burden and the blame for sins of omission and commisison in the care of the well and of the sick.

The dement, the criminal, the beggar and the victim of accident all fall, at times, within the province of the health office.

Where sanitary codes are provided for the maintenance of the power and dignity, as well as for the activities and efficiency, of the health office, such codes are quite broad in the scope of their intention and authority. At many points the mere function of the health office as an advisory agent ends and the power of authority and of action begins, so relating the health and police activities that in many places they are one.

In the development of community protection, the law has first contemplated the protection of the individual against violence, against crime of all degrees; then it conserves property interests, familial rights, dictating the manner in which the law shall be fulfilled. As an individual right, state medicine is organic, and under its provision must fall all protection of the individual so far as his physical well being is concerned.

The regulation of vice has usually fallen within the duties of the police, and, wherever laws have been promulgated, they have been framed either with the view of control or of punishment. At no time have such laws proved efficient, for the large reason that they have lacked the elemental idea of public health interest, while the moral side has now and then colored police practice.

The ground has always been a delicate one, because of its essential relation to the personal privilege and to the personal habits of individuals in the community, heretofore affecting the accepted delinquency of the male.

Forensic medicine deals with the phases of the question which come within the law—up to a certain point. Rape and murder are prominent subjects of medico-jurist interest in connection with sex influences, but these represent only a part of the whole question.

Every now and then groups of men and women have met in conference to weigh the problems of hygiene as related to sex, and have debated the ways and means of betterment. Here sociological phases come in, and the public interest appears in the divisions of the subject which relates to prostitution, and to the diseases which are associated. From such gatherings have come a wider knowledge of the subjects discussed, with a more enlightened tendency in the enactment of laws regulating the control of the conditions affected. Even states and the national government have provided legislative acts to further the improvement in the moral side of these questions, and so far as the general welfare is concerned, good has resulted. Uniformity, however, has been lacking, with the result that the situation is one of present unrest rather than of any approach to a real solution.

The organization of permanent bodies for the purpose of studying questions of social hygiene has materially helped in the dissemination of interest and of knowledge, but every day the newspapers present a series of accounts of the continuance of vice in all its ramifications—from the cases of crime from mere lust to those of refined perversion.

We are quite far from an ideal status, then, and in the serious review of what has been done, there must be the reflection that perhaps the attack has been wrong. The quiet endeavor of local and national organizations with the altruistic purpose of reclamation and of control of those who have been caught in the web of vice is deserving, but more of less barren of result in the face of the vast problem involved. The moral effect is good, but the practical results are doubtful.

This brings us to the topic under discussion, and to make it effective in presentation, the question may be propounded:

Is the sex question altogether one of law and of morals?

We submit that for the purpose of results it is essentially a question of public health. The discussion and the argument must present many faces, for to bring the subject within the field of state medicine, *ergo*, within the scope of public health, we must assume from the start that the prime object in the consideration of the sex question as a matter of health is one which concerns the preservation of the individual as a community unit.

Where may we begin?

Sex hygiene is today a fetish, bandied about by the pedagog, the preacher, the politician and the physician, in the endeavor to escape the responsibility of indicating the application of the subject to a practical science in education. Congresses debate some phases of sex hygiene; both sides are vehement in urging and opposing the dissemination of knowledge among the young, and while they continue to disagree, the young go on learning in the old-fashioned way.

The present day board of health bulletin teaches many valuable lessons to the young and to the old—about the fly, about the mosquito, about the germs of disease, about drinking water, about habits of function of the bowels, about the sanitary care of the house and the premises, not even hesitating to go into details when discussing the privy and its dangers. Why should the elemental ideas of sex be taboo?

Preventive medicine is the largest function of the health office today. The knowledge of dangerous diseases is one of the chief weapons against them. The additional knowledge of the means to prevent them would do away with many diseases in time.

Sex hygiene means more than the mere knowledge of sex and the functions related —it means the government of the function of sex so that the purposes of sex may be preserved for their proper uses and ends. The education in the physiology and anatomy of the sex organs may be left to the pedagog, but the instruction in the hygiene of sex as above defined should be within the duties and obligation of the public health office, as best qualified to disseminate such instruction in a way in which it will do the most good.

Parents fail in this instruction, for the reasons that they are not sufficiently informed themselves and that their attack upon the question is too often colored by the moral side to accomplish the proper results; facts are needed, not preachments.

The school teacher is apt to leave the kernel of the argument while displaying the shell of the subject to the pupil, who then seeks the missing information elsewhere. In the school, the mixed group of scholars makes it impossible to place such knowledge so that it will count.

The public health office has grown into a distinct place of adviser in matters of general welfare. In most states the board of health bulletin is welcomed and does good because it stands for the highest usefulness in its service and the public, the community and the individual know that there is no ulterior motive. The educational value of this work in the hands of the public health office cannot be too highly estimated.

As to the scope of the material to be distributed by the public health office, much might be said. The element of disease must come in and so must the discussion of related vice. The moral side is debatable, but it cannot be set aside without consideration, for in any discussion of the diseases involved in the hygiene of the sex organs the questions of illicit indulgence, as well as the proper regulation of sex habits, must have some place. The development of the subject would probably direct this particular phase better than any formulated or stereotyped plan of statements. This brings us to firmer ground where the exact obligation of the public health office meets the problems of the diseases of sex, their regulation and con-

trol. As the first consideration we are bound to discuss the largest source of venereal diseases, viz., prostitution.

As yet prostitution is not a matter of either control or direction so far as the public health is concerned. It should be The provisions for the proper sanitary care of prisons and their inmates are already a part of the business of state health authorities; asylums and the eleemosynary institutions are gradually falling within the scope of the direction of state health offices. Why should the question of prostitution still remain untouched, and why should it be left to the absolutely inefficient care of the police?

The recent review of prostitution in Europe by Abraham Flexner*, and the study of the heterogeneous laws** governing this social problem abroad, would indicate anything but uniformity and everything except success in regulation or control.

We may not ever succeed in eliminating prostitution; it is yet debatable if such a thing is desirable, but the control would certainly be nearer if this vicious phase of community life were approached from the public health point of view instead of from the police or purely moral sides, in which so far all efforts have radically failed.

Woman is emancipating herself, and as soon as the ferment of her unrest in suffragism is spent there will be a wholesome organization among women for the improvement of their sex, and they must meet the recondite questions as well as those which are political and economic. Today the victims of vice are either scorned by their better sisters or are held as objects of charity; in time a new phase may come. This is to be hoped. The way may be prepared for woman's aid by the study of prostitution from the health side, and by placing it in a class with other diseases of sex, and it is no assumption to speak of prostitution, syphilis and gonorrhea as sex diseases. We may go further and class the phases of sex aberration, known as perversion, as falling in this same group.

The problem is a large one, and it has many ramifications which would afford food for review.

The attack upon the legislative regulation of the age of consent, so widely varying in several states, is one feature which should be noted. This is really a legal phase, but within the measures of prevention of vice this occupies no insignificant place.

The survival of practices, anciently known to the votaries of the multiplied Aphrodite, and broadly classed in the term of perversion, needs to be studied as a factor in public health. The public is grossly ignorant—many physicians, too—of the meaning of terms and of the acts defined under such words as masochism, sadism, onanism, Lesbianism, or fetishism, etc., but a better understanding would ventilate vice. When Kraft-Ebing's book on psycopathic sexual problems was published, it was clandestinely circulated, because the information contined was hardly accepted as veritible. When Havelock Ellis printed his first book on sex, his publisher was imprisoned, and he would have been if he had been in England at the time. Masoch's "Venus in Furs" has long been contraband; so has the work of the Marquis of Sade. But we are awakening and the public wants the truth, without the atmosphere of mystery which has hitherto created a natural evil reflex influence.

The medical profession has engaged the problem of making healthier men and women and the obligation rests upon us to see it through. We work in our laboratories for the obscure causes of diseases. We see our heroes go to the front where the lines of battle rage and in the rear where the ravages of disease imperil them, and we share in their glory while we applaud their en-

*Prostitution in Europe, by Abraham Flexner. The Century Co., New York, 1914.

**European Police Systems, by Raymond B. Fosdick. The Century Co., New York, 1915.

deavor. Is it any less a burden to undertake this sex question which has always been intangible in other hands?

Perhaps it is too radical to suggest at this time, but with the socialist forces developing in this country, showing organization in meeting community problems, it should be no great task for our public health office in state medicine to undertake the sex question as it relates to the public welfare.

"The Public Health Aspect of Syphilis," by Dr. Lloyd Thompson, Hot Springs, Ark., discussed in connection with Dr. Dyer's paper, will appear in a current number, probably March.

DISCUSSION ON PAPERS BY DRS. DYER AND THOMPSON.

Dr. E. H. Martin, Hot Springs, Ark.—I do not know when I have as thoroughly enjoyd two papers as I have the excellent ones which have just been presented. They are interesting from the standpoints of both science and common sense.

As to the origin of syphillis, I am one of those who believe that historical and documentary evidence shows that the disease, like tobacco, the potato and many other things, originated in the new world.

The history of the disease shows that it was in the new world, and no one doubts that it was here long before Columbus came, and apart from the very simple and very uncircumstantial history of its being transmitted by men of Columbus' fleet, we have the evidence of both historic and prehistoric bones which indicates that the disease was indigenous to the new world. The Aztec bones, the bones of the mound builders and prehistoric and modern Indian bones show in a large percentage of cases the ravages of syphilis. On the other hand, in the eastern hemisphere, neither the prehistoric bones nor those more modern, but previous to the fifteenth century, are said to show any indication of syphilis whatever.

It would be difficult to add anything to the facts as stated by the essayists to make more plain the importance of syphilis to public health. They have told you of the millions killed before being born and of the thousands who are born to an early death. No accurate statistics can be possibly made of the actual economic loss from syphilis of the cerebro-spinal system. In fact, there is no disease, the control of which would be a greater blessing.

The question is, "How may we control it?" The methods suggested of education and personal and public prophylaxis will do much, but apart from education there is very little that can be accomplished except from the vigorous specific treatment of each case.

I cannot endorse Dr. Thompson's ideas as to the legal control of the disease. It is all right for a man to have a clean bill of health in order to get a marriage license, but the contamination of brides, while it occurs, constitutes a very small factor in the spread of the disease. Then, should we require every physician to report every case of syphilis, we would simply find that no more cases of syphilis would apply to the medical profession for treatment. They would be treated by means of patent medicines and by old women or wise drug clerks or anyone else who was not compelled by law to make the matter public. There are so many cases who are not at all responsible for their infection, which is universally regarded by the laity as disgraceful, that it would be an injustice to require their condition to be made public. Hundreds of cases of this disease are acquired every day in perfectly innocent ways, either venereal or non-venereal. During the past eight years I have seen thirty-nine physicians with chancres on their fingers or hands. Not one of these physicians, not a single one, made a diagnosis of syphillis from the chancre. They were all in the secondary stage before they realized what the trouble was. These physicians and thousands of others over the United States, were wounded on the field of daily battle and acquired syphilis in the discharge of their duty. To make their conditions public would be to take away their means of livelihood. Very few people care to send for a syphilitic doctor, especially in family practice. I have seen many other cases with chancre of the tonsil acquired innocently through the use of common drinking vessels and possibly from kissing. There was one case reported in my town by another physician which undoubtedly had a gastric chancre, which was at first considered an ordinary ulcer. Other extra genital chancres are numerous, as is also the spread of the disease to the innocent in lawful wedlock. It would not be right to have these young men and women and old people and children who have acquired the disease without even knowing what it was, listed as being, according to public opinion, worse than lepers.

It will also be found impossible to control the spread of syphilis by an attempt to control prostitution, as a clandestine prostitute is a much more common source of the disease than a known prostitute. Teaching children sex hygiene will do no good. I think it is quite wrong to teach sex hygiene in mixed schools, even when the girls and boys are taught separately, they are allowed to mix together afterwards, and much more unwholesome suggestion is left from a good lesson than one would suppose.

The men we see coming to us with avoidable syphilis are men who knew everything of sex hygiene that could be taught them, so why pretend to believe that knowledge will be much protection.

The hope of the human race in the fight against syphilis is in salvarsan. It can be used early and intelligently, and even if not pushed to an absolute cure will prevent each new case from becoming an individual focus of distribution. It has so reduced the number of syphilitic patients coming to Hot Springs that, even before the influence of the war, the number of baths given at that place had fallen off nearly one-third. When one considers that the syphlitic visitors to Hot Springs were never more numerous than one-half of the total number you can readily see that a loss of one-third of the total number means a reduction of two-thirds of the syphilitic. We see

comparativley few cases of secondary syphilis at Hot Springs now, and in fact the largest class of syhpilitic patients we have are cerebro-spinal cases who have passed the stage where they are dangerous to the public, but who have also passed the time when a permanent and complete cure can be expected, and who therefore wander from home for treatment.

I do not think it is too much for us to expect to see syphilis practically stamped out and rendered a rare disease within the next generation. At present, of course, we are not getting salvarsan, but we hope that the war conditions will change soon, so that the supply may become sufficient and some change made to render it less costly.

I wish to thank Dr. Thompson and Dr. Dyer for bringing these subjects before us, and to compliment the masterly way in which they have done so.

Dr. R. N. Whitfield, Florence, Miss.—I haven't very much to say. In reference to Dr. Martin's statement that the boys and girls were kept in separate schools at Senatobia, Miss., will say I was over there last winter and found that the high school boys and girls are no longer attending classes in separate buildings.

I haven't heard much said about gonorrhea in the discussion here this afternoon. It seems that more stress has been placed upon syphilis. Of course, the papers were on syphilis, but I believe that gonorrhea is doing a great deal more harm in our country than syphilis, and I believe that the best way to prevent it and get at this matter, would be for our State Boards of Health to issue bulletins on gonorrhea at intervals and bring out the point that over sixty per cent of the operations in our hospitals on our women are due directly or indirectly to infections of gonorrhea, and I believe that if our girls should read these things that they would not be in such a hurry to marry every old rake that come along and asks their consent to marry them.

The average boy who has reached sufficient age to run around any, if he becomes infected, instead of going to a reputable physician for a cure, will get some nostrum under the label H G C—"He Got Caught—He Got Cured—in *three* days"—or some other equally misleading concoction, and use it for a period of from three to five days. Then he thinks that he has had a simple trouble; hardly regards it as more than an ordinary cold; he feels he has been cured; goes through life feeling no uneasiness. infects his wife, and brings misery on himself and family.

If we could realize that it is time to bring this knowledge to girls and mothers and give them this information first hand, it would put such subjects under observation and suspicion and put our women in position where they could protect their daughters; and it would cause the young men to learn that contracting gonorrhea is a more serious matter than "catching a cold."

Dr. A. L. Stokes, Muskogee, Okla.—Confusion, as to place of meeting, prevented me hearing Dr. Dyer's paper, in which I was most interested. Prudery for many decades has covered the sexual system with a fig leaf, under which it has been allowed to rot.

I feel like apologizing for the medical profession in that, as a whole, it has been so lax in meeting the important problem of sex.

After all, the sex function is really the mainspring of all human endeavor; emasculate the race, and you take away the motor force that urges a man on to dare and to do; and therefore wherein so much is involved is it not self-evident that a graduate of our high schools should know as much about sexual physiology (not sexual theology) as they do about the processes of digestion?

Great as are the evils of gonorrhea and syphilis, I am not so sure but that they are exceeded by other violations of sexual physiology which we have as yet taken little note of.

I venture the assertion that at the bottom of every divorce proceeding, with the possible exception of alcohol, the sex problem is the primary disturbing factor, for where two human beings are in this respect mutually compatible and are enjoying physiological relations, there is absolutely no force that can separate them.

Much of what takes place in the dim light of our parlors on Sunday evening is possibly the cause of many cases of prostatic hypertrophy ovaritis and premature sexual incompetency.

To illustrate the point, I recall the case of a young man about to be married. He was a stalwart, broad-shouldered, athletic young fellow; about four weeks after his marriage he came to me in a somewhat distressed state of mind, confessing that his sex relations were not satisfactory, that he had severe pain in the perineum, so that he had to sit on the edge of the seat when riding on the cars. Examination revealed an acute enlargement and inflammation of the prostate. He asked what caused it. I in turn asked how often he visited his bride-to-be before marriage. Every night. How long did you remain? Reluctantly admitted ten, eleven and sometimes twelve o'clock. What time did the family retire? Nine of ten o'clock. What did you do from that time until you left?

"You are getting a little personal, doctor," was his reply. I, however, satisfied myself that for several hours every night he subjected himself, and also his bride, to intense sexual excitement without, be it said to his credit, physiological depletion, but aside from the moral question involved the latter would have been less harmful. This is not an exceptional experience, but an exceedingly common violation of sexual hygiene.

It is in the adolescent state and young manhood, when the sexual system makes its presence known by a vigorous awakening, that instruction is of most value. Sensuality is at all times to be condemned, on the other hand, a strong sexuality is desirable, as it is this function which gives strength to the muscles and steadiness to the nerves to do the world's work.

The solution of the problems of sex is largely dependent upon knowledge, for intelligent men and women, as a whole, do not continuously do those things which are calculated to do them harm, and it seems to me that the schools and colleges are the places where the most good can be accomplished.

Every city ought to have at least one physician who is capable of giving such information in this branch, as in others, that can be fully comprehended, without the slightest danger of arousing erotic sensations or disturbing purity of thought.

Dr. Robt. Wilson, Jr., Charleston, S. C.—The problems that have been raised by the papers read by Dr. Dyer and Dr. Thompson are too tremendous and too important to discuss here in all of their phases. They are not only medical questions and engage the best of medical thought and skill, but they are sociological and moral questions as well, involving considerations which enter into the very fabric of society.

I have risen to express myself on just one point suggested in the discussion, and that is the question regarding the teaching of sex matters generally in the public and private schools; and whether I am in the minority or not, I desire to record myself as opposed to the proposition. There is no question in my mind that the proper way to govern or control these diseases is by proper education, but I am convinced from a careful study made of the matter and from observations drawn from my personal experience, that the public school is not the proper place to impart this information. The proper school for instruction on questions of sex hygiene is the home, and the best teacher of the boys and girls of our country is the mother; and I believe that the next best teacher of them is the father. I am satisfied that it is in the home and not in the school that this instruction should be given. I have been told upon authority that I cannot question, that in one of the large cities of this country, a professor of philocophy was accustomed to give lectures on gonorrhea and syphilis to the young men of his class. After two or three years the local physicians requested that the lectures be discontinued, inasmuch as every year after the lectures were given there was a marked increase of gonorrhea and syphilis among college boys.

I believe that there were suggestions made in the course of the lectures that were so distorted in the minds of the listeners that they became harmful, and while the information imparted may be intrinsically good, I am satisfied that when given to boys and girls in groups it is liable to harm. The child should be taught at home when he becomes large enough and old enough to understand the nature and functions of sex. And let us not forget that we are dealing with one of the profoundest and most potent of our instincts and that the control of this powerful force can only be accomplished by him whose ideals are high and whose will is strong. Education. therefore, will fail of its purpose if it is not directed toward the strengthening of character.

Dr. W. S. Leathers, University of Mississippi—I think this subject is one of the greatest and most important and should be emphasized with as much force as any other questions we have to deal with. It seems to me that it is exceedingly essential that we should adopt and obtain the very best program or plan of action, especially applied to the public health side of this question.

Dr. Wilson is emphatic that this problem should not be dealt with through the public schools. Having been in the public health work for several years, I have thought a great deal about the problem, and it is a fraternal problem, and I have considered the question as to the probability of working out the problem through the public schools. Now, it seems to me that it is possible to work it through the public schools. In so far as leaving a problem of this importance to be taught in the homes of our people, we must realize the fact that the great masses of the people are ignorant, the parents are ignorant; the fathers do not comprehend the problem at all, and is not competent to teach the boy upon the questions; neither is the mother competent to teach the daughter upon all the phases coming in contact with the questions arising outside the family, nor is she competent to teach the son in every phase of the question. I am speaking of the great mass of the rural people, and for that matter a large percentage of the people in the cities; and it occurs to me that this question could be dealt with upon a sane and sensible basis, but of course there are certain points which would have to be treated delicately or left off entirely, as there are phases of certain other questions which have to be dealt with delicately. It is, of course, possible to excite in the minds of boys or those persons who do not know anything about a subject, such as this, as it does in those who do not understand other subjects; it is possible to excite those hearing discussions of subjects of this nature in schools some degree of morbidity, since, the intelligence of the boy is disposed to undertake to find out more than he has been told—as they are likely to find out more than they are told—as Dr. Wilson expressed it, they are disposed to take it in the wrong manner and get caught. But is it not possible to institute a system whereby it will be possible to have a well trained woman to deal with this problem, so far as the girls are concerned; a woman who understands it in every phase, can teach on these subjects and make it possible for the girls to understand the problem from their point of view. There is no reason why the State Boards of Health should not cooperate with the principals of schools upon a proper handling of the subjects. The State Boards of Health could co-operate with the school boards upon a proper method of placing it in the scheme of public education. I see no impropriety for a man who understands his business in these respects coming to the principals and saying, "I would like to talk to the boys upon sexual hygiene and sexual subjects;" or some lady who is qualified and understands these subjects going to principals and stating that she would like to talk to girls about these matters. Of course as to the public school telephones I wouldn't say just how we are going to get at that, but some way could be arranged to get around difficulties which might arise on that point.

As stated before, the people of the homes are not well enough informed on the subjects to teach it as it should be taught to girls and boys; they are too ignorant on the subjects in all phases, and it appears to me that we of the Southern States and of the Southern Medical Association could see that it be taught in the public schools.

There is one man in the North in my opinion doing a magnificent work in this regard, and that is Doctor Hall, of Chicago, in speaking about six months ago to student bodies, boards of education, of the universities, in this country, stated that the subjects treated were having a remarkable influence. It certainly seems that we could have it injected with perfect propriety in the public school systems.

A Member—I recently saw a few phases of

the question gone into, illustrated by a series of lantern slides thrown on a screen, demonstrating the effects of venereal diseases, and in addition showing the pictures of women and men passing through the various stages of syphilis and gonorrhea and their ravages. If the boards of health would take up the question in their administrations of health regulations and make demonstrations of these diseases and their effects on the victims in the schools, not merely for the horror of the thing, but simply talk and demonstrate it in the right way and give lectures on the matter in a suitable way, it would have a beneficial effect. That would be a question for the public schools as to who would deliver the lecture, and it would be a matter of selecting the right party, the right man or the right woman to do it.

I think that Dr. Dyer has hit the nail on the head. I wanted to emphasize what he said. I think he is a little bit wrong in his statement that the father and the mother doesn't teach the child simply because he or she has to learn from him or them. The father and mother do not know how to present the matter. The thing to do is to teach the father and mother also along these lines. I believe that the schools are the proper places; it is the quickest way. It has not met with absolute success every time where it has been tried. I know that. I think the only thing that we can do is to try to get the best instruction that we can and work out the system in that way. I believe that the proper solution of the problem will depend upon a gradual education of the people up to the necessity of such a system.

Dr. Isadore Dyer, New Orleans (closing the discussion).—Dr. Martin had evidently missed the text or the intent of the paper, as the police control of prostitution was distinctly opposed, and this social condition was referred to health supervision as belonging in the class of sex diseases, just as are syphilis and gonorrhea.

At conferences of men and women sex hygiene has been frequently discussed as a sociological problem, without much success, so that the question in its unsolved state would seem to be rather one of public health than of public morals.

The subject is one usually neglected by the physician, because it has not been brought home to him properly. Sex hygiene is a question of state medicine, and no better source of public dissemination of instructions offers than the service of the public health office.

I had an experience recently with a young man who had acne, who labored under the impression that this morbid physical condition was the result of continence, and he had become morbid over the sex proposition before him. The physician can usually set these boys right, and it must become more and more the physician's duty to advise such young men.

A CONCENTRATION METHOD FOR THE DIAGNOSIS OF MALARIA.*

WILLIAM KRAUSS, M.D., AND J.S. FLEMING, M.D.
Memphis, Tenn.

This experimental study was undertaken at the suggestion of Dr. L. W. Haskell, of this city. Dr. Haskell argued that a concentration method ought to be possible, similar to the antiformin method for sputum. At first it seemed as though the Ross method fulfilled the requirement, but it was decided to undertake a series of experiments to work out a technique, and after much experimental work, sufficient success was achieved to settle upon citrated salt solution as the diluent, formalin as the fixative and water as the hemolyzer. It was found that, unless some fixation preceded the hemolysis, the parasites would rapidly disintegrate. Occasionally, working very rapidly, a few distorted parasites could be made out. This is prevented, in the original Ross method, by the drying of the blood before hemolyzing. In the Ross smear the parasites are so distorted that even the expert is often left in doubt. The Ross technic, on the other hand, is applicable to smears examined at leisure some time after the specimen is obtained.

In order to make the proposed method a serious competitor of the Ross method, it had to meet the following requirements: It must be available to the general practitioner, at least to the extent of enabling him to obtain specimen and deliver at the laboratory at his leisure; it must show at least as many or more parasites to the field; it must, if possible, render them

*Read in Section on Public Health, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas, Nov. 8-11, 1915.

This paper is part of the Symposium on Malaria.. The other papers, with discussions, will appear soon.

more recognizable than the thick film; it must be useful and practical for workers in the field; it must present no great technical difficulties. We think that the only negative possibility in these requireemnts is the need of a high-speed centrifuge; low speed centrifuges will not give satisfactory precipitates. We think one of the distinct advantages of the method is the possibility of removing most of the leucocytes as well as the red blood corpuscles. In other words, our present claim for the technique is that it is available to the general practitioner (in the same sense as the Ross

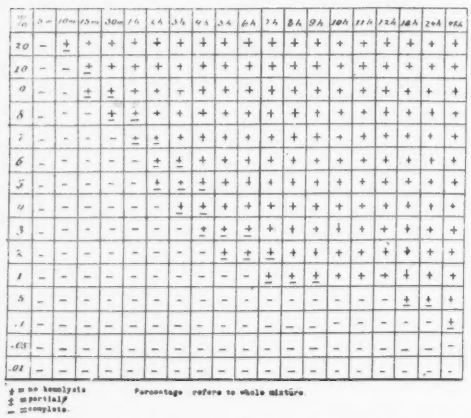


Table I.—Showing graded strengths of 37% formaldehyde solution used and effect of same on hemolysis at different time periods.

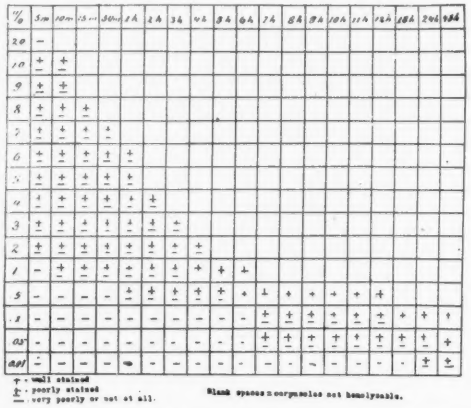


Table II.—Effect of formalin percentages and time periods upon staining of large schizonts and gametes. Note that best pictures obtain in weaker solutions after four hours.

method) and to the field worker, furnishes greater concentration, removes practically all other cell elements, and produces a smear that preserves the parasites morphologically and tinctorially. The larger (nearly grown) parasites frequently tear somewhat in making the smear, but not enough to interfere with their prompt recognition. In one case, no parasites had been found after hours of search, and the concentration smear showed two parasites in some fields.

The technic is conveniently divided into two steps: 1, that of obtaining the blood; 2, that of making the smear.

For obtaining the blood, some sterile 15 to 30 c. c. corkstoppered bottles are provided, containing 10 to 20 c. c. respectively, of a solution made by dissolving 2 grams chemically pure sodium citrate and .85 gram c. p. sodium chlorid in 100 c. c. freshly distilled water. The bottles should be sterilized once with their contents. A few of these can be kept in the emergency bag. To remove blood for diagnosis, a sterile 2 c. c. all glass syringe is first charged with ½ c. c. solution, filled from a vein, and the contents immediately injected into the bottle. The mixture should not contain more than 20 per cent of blood. It is then lightly shaken and replaced in the bag. Blood collected in this way will keep about as well as serum for Wassermann tests.

TECHNIC FOR MAKING SMEARS.

1. Add the amount of formalin indicated in the chart. Usually about .5 c. c. of a 1:10 dilution of official 37% formaldehyde to the smaller bottles will give good hemolysis and good fixation. Small rings are well fixed in one hour. Large tertians and gametes stain best after four hours of contact with formaldehyde. They can be recognized, however, after fixation for one hour. Quicker fixation may prevent hemolysis, and can not be recommended. The tables will elucidate this point further. The only portion of the tables requir-

ing study for practical purposes is the part defining limits of fixation, staining and hemolysis. Even this is of value more to enable one to avoid covered experimental ground. 2. After fixation, using the system suitable to the time available, the contents of the bottle are put into a centrifuge tube and spun fifteen minutes at 2500, or ten minutes at 3000, R. P. M. 3. Most of the leucocytes form a cream on the surface of the deposited blood, and can be pipetted off with the supernatant fluid, preferably with a vacuum pump* 4. The tube is then filled with distilled water, shaken until hemolysis

%	5 m	10 m	15 m	30 m	1 h	2 h	3 h	4 h	5 h	6 h	7 h	8 h	9 h	10 h	11 h	12 h	18 h	24 h	48 h
20	−																		
10	−	−																	
9	−	−																	
8	−	−	−																
7	−	−	−	−															
6	−	−	−	−	−														
5	±	±	±	±	±														
4	±	±	±	±	±	±													
3	±	±	±	±	±	±	±												
2	±	±	±	±	±	±	±	±											
1	±	±	±	±	±	+	+	+	+	+									
.5	−	−	±	±	±	±	±	+	+	+	+	+	+	+	+				
.1	−	−	−	−	±	±	±	±	±	±	±	±	±	±	+	+	+	+	
.05	−	−	−	−	−	−	−	−	−	−	±	±	±	±	±	±	+	+	+

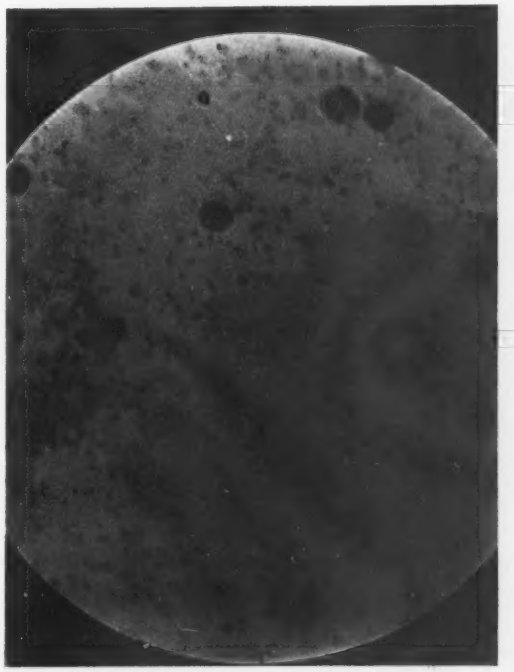
+ = well stained.
± = poorly stained.
− = very poorly or not at all.

Blank spaces = corpuscles not hemolyzable.

Table III.—Showing greater range of tingibility of small ring forms.

is complete, centrifuged again, the fluid poured off and slightly drained, and the remainder drained on a slide, dried, fixed and stained in the usual way. We prefer staining a little longer than ordinarily. Also the technic recommended by one of us* gives far more satisfactory results than one-solution stains, as it eliminates washing and the formation of precipitates. Beautiful pictures are obtained in fifteen minutes. This technic entails less actual work than some of the modified thick film methods.

The following precautions are necessary: Commercial formaldehyde must be neutralized carefully with normal sodium hydrate. The citrate solution, also, may be acid to litmus and may have to be corrected. Rewashing after centrifugation would remove these trou-



bles, but the parasites have not, in our hands, endured this manipulation.

If haste is required, and the time elapsing before arrival at the laboratory is known, the formalin may be added at the source. One may argue that delay may be dangerous, but if it be considered that search for hours is frequently futile, this objection will not appear to have much weight.

If the blood is to come from a distance, it is well to fix in advance on a twenty-four to forty-eight hour basis; in other words, adding two drops of a 1:10 official formaldehyde to every 10 c. c. of mixture of blood and citrated salt solution.

The accompanying photo micrograph shows the picture obtained by this method. A little practice is required to get such results. In some fields of this same slide there were easily four times as many parasites, but there the film was too thick for photographing.

*Since this paper was read one appeared in the Am. J. Tropical Dis. and Prev. Med., Vol. III, No. 6, by C. C. Bass, from which it appears that careless pipetting off of leucocytes might remove the gametes and large schizonts.

*Krauss: What Every Doctor Should Know About Malaria. South. Med. Jour., Vol. 1, Nos. 1 and 3.

The authors desire to return thanks to Dr. Haskell, Dr. Rucks and the internists of the City Hospital staff for valuable assistance, and to Dr. Haase and Miss McGinnes for photomicrographs.

AUTHORS' ABSTRACTS.

Tropical Diseases and Public Health.

Sparganum Mansoni. First Reported American Case. Found in a Breast Tumor at Operation. By John T. Moore, Houston, Texas. Transactions of the American Society of Tropical Medicine, 1914, pp. 236-247.

The author presents the history of a case infected with *Sparganum Mansoni* (identified by Ransom, of United States Department of Agriculture). The special points were the patient's exclusive residence in the United States, his use of shallow well water and fruit and occasionally raw vegetables.

Twenty-seven years previously, a non-inflammatory tender mass appeared on the margin of the ribs on the left side. This disappeared after one year. Six months before operation the mass was noted just beneath the left breast—causing continuous dull pain and sometimes sharp pains.

Operation revealed the mass as a *Sparganum Mansoni* imbedded in the fibers of the major pectoral muscle. The parasite was alive, and had a contractile and expansile movement. Was white and tapelike, 21.5 cm. long, and unsegmented. The literature is reviewed and reveals the case as the twenty-fifth on record, and the only case reported in the United States.

Malaria in the Philippine General Hospital,, Manila, P. I., During the Fiscal Year 1913. By David G. Willets, U.S.P.H.S., Manila, P. I. *Philippine Journal of Science,* September, 1914. pp. 441-452.

A diagnosis of malaria was rendered in 5.17 per cent of 6,732 cases discharged during the year; in 10.6, 2.09 and 0.3 per cent of medical, obstetrical and surgical cases respectively.

Organisms were found in 85.1 per cent of 341 cases examined microscopically and in 86.7 per cent of fifteen cases which showed malarial lesions at autopsy. In the two cases which were negative *ante mortem,* chronic lesions were found and death was not due to malaria.

Of 296 cases positive microscopically, 54.4 per cent were infected with tertian, 50.6 per cent with aestivo-autumnal, 1.0 per cent with quartian, 7.4 per cent with tertian and aestivo-autumnal, and 1.4 per cent with unidentified parasites.

A leucopenia was present in 47.3 per cent, a normal count in 42.7 per cent, and a leucocytosis in 10.0 per cent of 131 cases positive clinically and microscopically. Some of the normal and abnormally high counts were probably due to the degree of infection present coupled with the stage at which specimens were secured and some of them probably to complications in the intestinal and genito-urinary tracts.

Typhoid fever being excluded, the malarial splenic index was 69.5 per cent among the first 1,000 thoroughly examined medical cases admitted during the year, and 85.7 per cent in 264 cases with enlarged spleens examined microscopically. Malarial organisms were not satisfactorily excluded in a number of instances.

Sterilization of Drinking Water by Calcium Hypochlorite in Field. By W. J. Lyster, U. S. Army. Military Surgeon, March, 1915.

The appliance consists of a canvas bag of specially woven flax, 20 inches in diameter and 28 inches in length, sewn to a flat galvanized iron ring, hinged so it folds at one diameter. Spliced at four equi-distant points on ring are two crossed pieces of hemp rope, enabling bag to be suspended. When filled with water it weighs about 330 pounds. Five nickel spring faucets are placed at bottom of bag. Empty bag weighs from seven to seven and a half pounds and folds conveniently for carriage, strapped to saddle or to new infantry pack when other transportation is wanting.

After bag is suspended and filled with water, it is sterilized by a small amount of hypochlorite of calcium. This is carried in measured doses sealed in glass tubes. A package of sixty tubes weighs ten ounces and measures 7 1-2 x 3 1-2 x 4 1-4 inches. Packed in corrugated paper, it will stand rough usage.

In the strength used, waters highly infected are rendered safe. Of course in such strengths (1-500,000) grossly polluted water will not be rendered safe. Water ordinarily used will be entirely safe after being so treated.

Comprehensive experiments demonstrate the bacteriological efficiency of the appliance. The organisms causing typhoid fever, dystenteries, including amoebic or tropical dysentery, and ciliates, are promptly destroyed. Even in vegetative form, amoebae are killed in fifteen minutes; ordinarily five to ten minutes suffices after addition of powder to render water safe to drink. Exposure of thirty minutes has been found to destroy all amoebae and ciliates under most severe conditions in a test.

Tuberculosis and the Negro. By A. W. Williams, Chicago, Ill. Journal of Outdoor Life, February, 1915.

The negro as a health factor is beginning to receive a fair amount of medical study and attention. The theory that he is more susceptible to tuberculosis than other people, that his high mortality from tuberculosis is naturally greater, is yielding to a belief that environment and social and economic restrictions account for these conditions. If any other race were subjected to the same environment of poverty, bad housing and sanitation, poor food, long hours at low wages, and alcoholism, it would prove as susceptible to and have as high a death rate from tuberculosis as is now ascribed to the negro race by vital statistics. The author denies that the negro has imported dangerous diseases. The diseases to which he most readily yields and of which he becomes a carrier are those of the white race.

During twenty years of practice in a large center of negro population, where the author treated as many whites as blacks, he found that where intelligence, environment and working conditions were the same the health standards of the negro compared most favorably.

Any law that is good for the white man is good for the negro, and the opposite is likewise true. Hence the activities of white and black social workers should be co-operative. There should be no antagonism, as the cause is that of humanity in common. With a more sane, more just, more intelligent attitude of physician toward tuberculosis it will be recognized as a penalty for infraction of the laws of nature and humanity.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

THE RENAISSANCE OF UROLOGY.*

By Hugh Hampton Young, M.D.,
Baltimore, Md.

I have chosen as my subject "The Renaissance of Urology." In explanation I may say that urology, comprising, as it does, the diseases of the urinary tract, was perhaps the very first branch of medicine to emerge from the clouds of ignorance in prehistoric times. This probably came about from the fact that when urination became painful, difficult or impossible, the male being was driven to that desperate necessity which is the mother of inventions.

Thus among the ancient Hindus, probably over a thousand years B. C., we find the catheter used to relieve retention of urine, the sound to dilate strictures of the urethra, and the operation of perineal lithotomy fully developed and widely practiced.

Sucruta's manuscript, giving us details of the operation of lithotomy, was written about 600 B. C. It is interesting to note that the perineal operation for stone, which is so skillfully performed by the native lithotomists of India today, is practically the same as that described by Sucruta 2,500 years ago.

In the writings of Hippocrates (460 B. C.) we find accurate descriptions of the formation of urinary calculi, of lithotomy and of nephrotomy; and this at a time when practically no other operations upon abdominal viscera were attempted. The history of major surgery may, therefore, be said to have its beginnings in the work of the early urologists, and to owe its inspiration to them.

By the Hippocratic oath the general practitioner of medicine was required to promise never to perform lithotomy, but to leave the operation to those who made a specialty of it; the so-called lithotomist.[1]

Celsus shows by his writings at the beginning of the Christian era that operations for calculus, retention of urine and urinary fistula were well developed, and Galen (130-210) and Auralianus (300 B. C.) describe certain progress in urology; but during the long years of the middle ages, "while medicine was in the hands of the monks who disdained surgical operations," the "Lithotomists" alone kept up the surgical spark. During this time the inhabitants of the town of Norcia developed such skill in lithotomy that they were called to all parts of Europe, and were frequently official employes of municipalities, where they attained great fame, thus being the first public health officers.

The operation for stone, which had thus far been entirely in the hands of these itinerant laymen, was finally adopted by the medical profession through the work of Germain Colot about 1460.[2] Colot was a French surgeon of renown. Declaring it a disgrace that an operation of such importance should have been so entirely neglected by surgeons, he went to Italy, ingratiated himself with a family of lithotomists, learned their methods, and then returning to France, instituted a series of experiments upon the cadaver, the results of which he reported to the medical faculty of Paris and at court. He then applied to King Louis XI, who granted him permission to operate on a criminal condemned to be hanged.

It is interesting to note that this historic

*Oration on Surgery, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas, November 8-11, 1915.

[1]Guiteras: "The Evolution of Urology." N. Y. Med. Jr., Oct. 11, 1902, who has been freely quoted.

[2]Fisher: Annals of the Anatom. Surg. Soc., 1880.

operation which was carried out in the presence of the king, was performed in the church yard. The patient showed great fortitude, was well in two weeks, and saved his own life, besides saving the lives of future generations by securing this operation to surgery.

Colot was decorated by the king, appointed the royal lithotomist, and became the father of a family who furnished France with its chief lithotomists for three hundred years. Although medical men, they kept the secret to themselves just as the Norcions had done, and were consequently reviled by the rest of the profession until Francois Colot, the last of the family, gave the secret to the medical world in 1727.

The general surgeons seemed unable to make a success of lithotomy, which was still the gravest and most difficult operation in surgery, so that again non-medical operators flourished—the chief of whom was a monk named Frere Jacques, who, marvelous to relate, invented and introduced the lateral operation for stone, which requires far more precision and expert knowledge of anatomy than the median operations, previously used. The story of Frere Jacques, his meteoric rise at court, the crowds that assembled to see his lightning-like procedures, his admission to the great hospitals of Paris over the protest of the surgeons, and his final departure in disgrace because most of his patients died, is one of the most thrilling histories of surgical literature.

Although discredited in Paris, he evidently flourished elsewhere, as he is said to have cut more than five thousand for stone, and often to have operated upon sixteen patients in one afternoon. He died in 1720, and his operation, perfected by the great Englishman, Cheselden, is notable as being based on the finest anatomical principles, in that it avoids injury to such important structures as the external sphincter, the cavernous tissues of the bulb, and the crura of the penis, thus preventing incontinence and sexual impairment.

To this day the non-professional lithotomist exists in the East, and even in Scotland only a century ago, Mr. Adams stated that "there was an old miller who was very famous for cutting persons for the stone." For some inexplicable reason the major things in surgery were largely left for uneducated operators; even Ambroise Pare was a blacksmith. Pare learned lithotomy from one of the Colots, and was one of the most accomplished in its performance.

My prolixity on this subject is due to my desire to point out surgery's debt to the ancient and mediaeval urological specialists who, almost alone, kept going the flame of major surgery when the forces of religious and medical superstition would have extinguished it. Indeed, it was not until John Hunter came that the solid foundations of scientific surgery were laid. It is interesting to note that at that time there were only two great surgeons in England, William Cheselden and James Douglas, both of whom owed their reputations chiefly to their operations for stone. Hunter became the pupil of one of these, Cheselden, the author of the present "lateral operation for stone," which he was able to perform in 54 seconds.

It is probable that this association with Cheselden, the foremost urologist of his day, inspired Hunter to undertake his masterly researches on genito-urinary diseases, and to collect at such great pains the wonderful specimens of urinary disease, particularly of calculus, enlarged prostate and kidney, which form the most striking and valuable part of the pathological work left by him. It is very evident, from a study of the clinical works of Hunter, that his private practice was largely genito-urinary in character. It was Hunter's practice to admit young men into his home for a long period of years as private students of surgery, and it is not surprising to find that of these men

who afterward became famous, and caused English surgery to rapidly eclipse the rest of the world, the majority were particularly interested in genito-urinary surgery. I need only refer to John Abernathey's celebrated treatise on syphilis, Sir Astley Cooper's classic book on the testicle, Sir Everard Home's two volumes on the hypertrophied prostate gland, and James Wilson's anatomical researches on the external urethral sphincter.

The history of urology in France, during the eighteenth and nineteenth centuries, comprises, as in England, the names of almost all the celebrated surgeons—for here again it was the most difficult and dangerous surgery performed. Commencing with Guy de Chauliac, we find Collot, Pare, Dionis, Le Dran, Desault, Dupuytren, Nelaton, Chopart, Civiale, Leroy, Hourteloup, Mercier, Maisonneuve, Guyon, Pousson and Albarran. The most important invention of this time was that of stone crushing by Civiale in 1818. This was further developed by Leroy, Hourteloup in France and by Thompson and Weiss in England. Mercier's work on obstruction at the vesical neck, and the ingenious instruments he devised were of great importance; but to Civiale first, and later to Guyon, the medical profession owes most of the solid foundation of urology, upon which so wonderful a superstructure has lately been reared.

Sir Henry Thompson in England, a brilliant pupil of Civiale, pursuing the careful research methods of John Hunter in anatomy and pathology, did more, perhaps, than any one man in the nineteenth century to bring urology into the very forefront of surgery, and to inspire men to devote their lives to this special branch.

While the school of Thompson in England, and that of Guyon in France, were increasing in vigor and force in the latter part of the last century, America and Germany had awakened, and were fast becoming powerful factors in a rapid advance.

Early in the past century America developed a remarkable coterie of lithotomists. The greatest of these was Dudley of Lexington, Kentucky, who had the remarkable record of 207 cases with only six deaths—1 in 34 1-2, or less than 3 per cent. Valentine Mott, the greatest New York surgeon, had seven deaths in 162 cases, and Nathan R. Smith, of Baltimore, three deaths in forty-five cases. The total for the United States, as collected by Gross in 1850 was 851 cases with only one death in twenty, whereas in Europe the proportion of fatalities was one in five, according to Coulson. Dr. Rodman informs me that Dudley had one series of 100 lithotomies without death—the best record in the world.

The greatest of all American surgeons, Samuel D. Gross, was himself a great lithotomist, and his principal work, "Diseases of the Bladder Prostate and Urethra," published in 1850, still ranks as a great classic. Although a professor of general surgery, and a prolific writer on many subjects, his most brilliant work was in urology, and he may really be said to be the father of American urology, though VanBuren and Gouley, and later Otis and Keyes, of New York, and Bigelow, of Boston, exerted a more continuous influence. These men were the peers of the European urologists, and by their very original contributions soon placed America in the forefront. Bigelow's classic researches on lithotomy challenged the admiration of the world and revolutionized the treatment of vesical calculus. Each of these men surrounded himself with ardent young fellows who have since formed the New York, Boston and Philadelphia "schools" of urology.

Austro-Germany lay dormant during this period of great activity in England and France until the latter part of the last century, when Simon, at Heidelberg, began his epoch-making work on the kidneys. A young woman with a ureteral fistula appealed to him for relief. The only possibility of cure lay in removing the kidney, but no one knew

whether life with only one kidney were possible. Could the repair of the renal artery ligated so close to the great aorta stand the pressure after absorption of the ligature? Might not emboli or peritonitis bring on early death? No one knew. In order to find out, Simon nephrectomized thirty dogs, and thus not only put the operation on a sound basis, but led the way to animal experimentation, which has revolutionized surgery in recent years (another debt of surgery to urology). The operation was then carried out on the patient with perfect success in July, 1869. The great Bruns carried out the same procedure two years later with fatal result, and the next patient of Simon himself lost her life. The tragic story of this case is so beautifully told by Pilcher,[3] that I cannot refrain from giving it again.

The patient was a brave little woman of Savannah, Georgia, who was sent across the Atlantic to Simon to be cured of a calculus pyonephrosis. All previous authority had condemned such a procedure; never before had it been attempted; not until the operation was happily finished did the apprehension leave him that he (Simon) might yet find himself confronted by the conditions which his predecessors had described as unsurmountable. For three weeks the convalescence proceeded without disturbance, and the wound had contracted until it was now insignificant. Simon, however, shared in that spirit of the older surgeons which prompted them to examine the cavity with their own fingers. They called the practice training their "tactus eruditus." No unfortunate patient could have a cavity opened or a wound made without the bystanding surgeons being invited to put their fingers into it—the omission was a breach of professional courtesy. The boldness and enterprise of this Heidelberg surgeon had carried him further than most surgeons. He had passed his hand and forearm through the anal sphincter, and along the large intestine until he could feel the kidneys and liver of his patient; he had made a practice of dilating the female urethra with his forefinger, which he carried into the bladder and by it guided a catheter into many a ureter (thus becoming the first to do ureter catheterization). Where his fingers had been previous to his approach to the bed of his now fully convalescent nephrectomized patient on this her twenty-first morning after the operation, who can say? The vexed question of antiseptics, rubber gloves and surgical cleanliness had not yet begun to trouble the surgical mind. So much the worse for this little woman from Georgia, and her dreams of future health. As the dressings were being changed the temptation to explore was too great and in went his finger. Within a few hours came a chill and fever. For ten days the battle between the body cells and the invading microorganisms continued, and then death!

Had Simon only heeded Lister, who four years before had published his great work on antisepsis (1867), the result might have been different. A similar fatal case of nephrectomy for calculus at the hands of the great Von Bruns put an end to kidney surgery for some time, and as late as 1879 Pilcher was able to find only fifteen cases in the literature. But Lister's teachings had at last found an audience, and renal surgery was among the first of the great fields of major surgery to feel its influence. In 1885, Samuel D. Gross, in one of the most masterly clinical analyses ever made, collected 450 different operations on the kidney and placed the whole subject on an enduring basis.

The next great advance in urology came from Austria—I refer to the invention of the cystoscope by Nitze in 1876. This instrument, which could not be perfected until Edison in 1879 brought forth the incandescent electric bulb, has not only revolutionized urology and brought it from darkness into light, but also has done more than any one invention to stimulate exactness in

[3] Annals of Surgery, 1900, Vol. XXXI.

diagnosis and the use of electricity in medicine.

Truly marvelous are the instruments which followed in steady succession. The ureter catheterizing cystoscope, the operating cystoscope, the photographic cystoscope, the stone-crushing cystoscope, the fulgurating cystoscope, the rongeur cystoscope, the cauterizing cystoscope, the urethroscope, the bar-excising endoscope, the laryngoscope, otoscope, gastroscope, proctoscope, and electric ophthalmoscope need only to be mentioned to indicate the tremendous activities which have been evoked by the development of the first cystoscope. In this great advance the genius of Germany and America have shared honors about equally. The great desideratum, catheterization of the ureters in the male, which had been looked forward to longingly but vainly for generations, was finally accomplished by an American, my predecessor at the Johns Hopkins Hospital, Dr. James Brown; and another American, Howard A. Kelly, made ureter-catheterization in women possible and easy and led to the brilliantly rapid evolution of renal and ureteral surgery, which immediately followed. Time will not permit me to do justice to other American confreres who have done so much for this subject—Tilden, Brown, Otis, Belfield, Koch, Valentine, Lewis, Buerger, McCarthy, Squier and others.

It is important, however, that I refer to the great diagnostic methods that have been evolved as a result of the ureter catheterizing cystoscope. The mere separation of the secretions of the two kidneys was a great step in advance, enabling one to recognize the diseased kidney, to discover early tuberculosis, unilateral hematuria, and with the development of the X-ray and pyelography various hitherto unrecognizable lesions. But it did not offer sufficient evidence concerning the other kidney. It did not remove the old dread that the remaining kidney might be unequal to the task of sustaining life when its fellow had been removed. For almost twenty years surgeons have been searching for an ideal functional test of the kidneys, and various drugs, generally dyestuffs, have been brought forward. Casper and Richter, who introduced the phloridzin test, deserve great credit for impressing upon the profession the need of functional tests, although their phloridzin test proved unsatisfactory. The ideal test seems to have been discovered; I refer to the phenolsuphon-phthalein test, the result of the work of four of my confreres on the Johns Hopkins faculty. Professor Remsen who discovered the drug, Professor Abel who showed that it was almost entirely eliminated by the kidneys, and Dr. Rowntree and Dr. Geraghty, who proved its clinical value by a great series of experimental and clinical researches.

Thanks to this splendid example of cooperative and consecutive effort between various departments, we now have an accurate method of determining factors of safety in renal surgery, and are in a position to know beforehand what should be done, and whether it is safe to do it.

A glance at the mortality figures during the past thirty years will show the transformation which the cystoscope, the ureter catheter and the functional test have accomplished in kidney surgery.

Gross, in his collection of 450 cases, found the mortality for nephrectomy for various diseases between 20 and 60 per cent. In America now it is between 1 and 5 per cent.

The Prostate.—The surgery of the prostate was even later in its development than that of the kidney. Although Covillard, in 1638, removed an hypertrophied lobe, after perineal lithotomy, Sir Henry Thompson, whose researches on the anatomy and pathology of the prostate are still classics of great value, stated as late as 1887 that successful prostatectomy was unknown.

It is almost tragic to hear this great urologist say: "I desire extremely to see such a result; I have on four occasions removed considerable portions of the prostate, but

without success. I have traveled considerable distances abroad expressly seeking it, but without succes." But at the same time he wrote younger forces were at work, and as a result of the cumulative efforts of Belfield (1887), McGill (1889), Goodfellow (1891) and Fuller (1894), prostatectomy became an established operation.

More accurate methods based on anatomical landmarks and pathological studies have greatly improved the perineal operation, so that the mortality rate, which was 15 per cent twenty years ago, has fallen to about 3 per cent for conservative perineal prostatectomy at our clinic. In a recent study of 775 cases, I found 30 deaths, or 3.8 per cent. Only eight deaths occurred within the first week after operation and ten after a month. These figures show how benign prostatectomy can be.

Careful study of cases, particularly as regards the kidneys, has had even more to do with a lowering of the death rate than a carefully planned anatomical operation. An early recognition that a large residual urine was a danger signal, especially if the patient had never been catheterized systematically, enabled us to so reduce the operative risk that it was possible to operate upon 128 consecutive cases without a death. Now that we have shown that the phthalein test gives an accurate index to the state of the kidneys, a means of determining when the operation may be safely performed is at hand, and with careful preparatory catheter treatment makes it possible eventually to operate on almost every case. One of our recent cases was 93 years old.

One of the most important urologic problems of the day is cancer of the prostate, which is now known to occur one-fourth as often as hypertrophy. It evinces itself in early cases as a localized very hard area in the posterior portion of the prostate, and, if routine rectal examinations were made, many early cases of cancer of the prostate would be detected. Ten years ago it was supposed to be beyond surgical relief. Now we have a well-established radical procedure, in which, although the whole of the prostate, the seminal vesicles and the neck of the bladder are excised, the anastomosis between bladder and stump of membranous urethra can be so effectively made that neither stricture nor incontinence follows.

We have now apparent cures in ten cases of cancer of the prostate, most of them over five years, and one of ten years' duration—the percentage of cure being about sixty-five. I predict a great future in cancer of the prostate.

Time does not permit to mention more than a few of the conquests of urology, but I must say a word in regard to the epoch-making advances that have been made in the treatment of vesical tumors. Even five years ago all statistics of results after operative excision of bladder tumors, both benign and cancerous, were so bad that Watson was boldly proposing cystectomy—complete removal of the bladder for all bladder tumors. The remarkable results obtained by Nitze with his cystoscopic cautery snare had been lost sight of. Then came Beer's report on the use of the high frequency electric spark which causes most papillomatous tumors to disappear as by magic, and the statistics of results were transformed. When one sees a bladder half-filled with sessile papillomata, each the size of a small walnut, become normal with not even a scar to show the site, one realizes that a wonderful therapeutic agency has been discovered.

Radium, too, is a force of marvelous power, the limits of which are little known, but which occasionally works seeming miracles. We have been using radium by means of special radium-carrying operative cystoscopes, in conjunction with the high frequency treatment of vesical tumors, and prostatic carcinomata with really promising results.

The surgery of the seminal vesicles has also made rapid strides. Fuller deserves much credit for the arduous way in which

he has finally impressed upon the medical profession the important role of chronic infections of the seminal vesicles and prostate in the cause of rheumatism, arthritis and heart disease. His operation of drainage of the seminal vesicles has accomplished wonders in curing hitherto intractable rheumatic infections. Recent improvements of the perineal prostatectomy technique have been applied to vesiculotomy and vesiculectomy and made them accurate procedures under visual direction, and have removed all guess work. I have extended this operation recently to the complete excision of tuberculosis of the seminal tract with the result that it is now possible to remove entirely great tracts of tubercular infection, which were previously beyond surgical relief, and with the same splendid results which have followed nephrectomy for tuberculosis. It is no longer necessary to relegate these sufferers with seminal tuberculosis to a life of slow torture and ultimate death, for many will get well after excision of the entire infected genital tract, just as nephrectomy and uterectomy has been shown to cure tuberculosis of the urinary tract.

Litholapaxy, which was the great contribution of America over a quarter of a century ago, has been simplified and facilitated by the invention of the evacuating lithotrite of Chismore, and the addition of the cystoscope has now made it possible to crush, evacuate, cystoscope and pick up a remaining fragment, all with one introduction of the instrument. The use of the median bar excisor or "punch" makes the cure permanent by removing the small bar or contracted vesical orifice, which has in the past been such a fertile cause of calculus recurrence,

I have already referred to the marvelous array of cystoscopic instruments which have been invented. It is now possible with the catheterizing cystoscope not only to collect the separated kidney urines, but to dilate strictures of the ureter, to facilitate the passage of calculi or even fracture them by electrical ureteral sounds, and to fill the ureters and kidney pelves with thorium nitrate, and thus obtain X-ray photographic demonstration of various lesions which were formerly hidden. The operative cystoscopes make possible the removal of cysts, tumors, specimens, foreign bodies and prostatic lobules; the division of strictured ureteral orifices and the removal of small calculi from the ureteral ends and from diverticula. Urology possesses unquestionably the most beautiful diagnostic instruments and laboratory methods in the entire field of medicine and surgery. But what has brought about this splendid achievement of accurate diagnoses and skillful operative relief? First the fact that high-class surgical work requires high-class mechanical and technical men, and, if possible, personal training and skill in such by the operators themselves. With the mechanical talent, ability as draughtsmen to convey one's conceptions and ideals goes hand in hand, and a survey of the literature shows many remarkable instances in which mechanics or art or both were developed to a marked degree in the great men of medical science. I need mention only a few: -Vesalius, the father of anatomy; Anbroise Pare, the father of surgery; Karcher, the inventor of the microscope; Cheselden, the great English surgeon who designed Putney Bridge; Scarpa, Heule, His, Charles and John Bell, Leidy and Lister, all of whom illustrated their own works with beautiful drawings; Charcot, the great neurologist, and Seymour Hayden, one of the greatest painter-etchers of all time, as well as a great surgeon.

Urology, probably more than any other specialty, owes much to mechanics and art in her devotees. The four moderns who have done most to develop the science are Nitze ("der grosse Techniker"), Henry Thompson, Henry J. Bigelow and Felix Guyon. All of these epoch-making men were great mechanics, inventive geniuses and idealists, whose spirits were never satisfied with existing or-

der, but constantly strove for perfection of detail as well as broad advancement in the field.

The second factor in the modern advancement in urology has come about as a result of closer cooperation between clinic and laboratory, for there is no branch of surgery which offers greater field and opportunity for varied laboratory work than urology.

A recognition of this fact led us, when preparing the plans of the James Buchanan Brady Urological Institute in Baltimore, to provide a most varied assortment of laboratory and research facilities, presided over by well-trained whole-time men. Not only were laboratories for pathology, bacteriology and clinical microscopy provided, but also for chemistry, physics and animal experimentation, with a well-equipped machine shop to make new apparatus and surgical instruments. The men presiding over these scientific activities have been called from various universities, and an internist, to work on borderline subjects between medicine and urology in both a clinical and experimental way, also devotes himself to the institute.

This close cooperation between scientific and clinical staffs has already proved of inestimable value, and the free discussion of the problems has been of much mutual help and inspiration.

All surgery has become so prefect in technical detail that advancement in the future will come from researches in the broader fields of chemistry, physiology and experimental medicine and surgery, but these can only be very fruitful when closely associated with the clinical work, and when the clinicians themselves become laboratory men and experimentalists. Such it has been our effort to provide for with the belief that urology furnishes a most fertile field for research, and the full expectation that it has a most brilliant future ahead of it.

THE STERILE WOMAN.*

By F. Webb Griffith, M.D., F.A.C.S.,
Asheville, N. C.

We are prone to believe that medicine is becoming an exact science; that the progress made in the past fifty years is marvelous. True it is that we are advancing and that many of the mysteries of yesterday are clearly understood today. Yet how much we still believe and teach, not because it can be proven or because it is based upon scientific investigation, but simply because it has been handed down from generation to generation and accepted with a blind faith.

There is probably no other gynecological condition, the diagnosis and treatment of which is more empirical than that of sterility.

I dare say that most of us think of the pin-point os first as the great cause of sterility, and dilatation and curettage as the one therapeutic measure.

My object today is not to present anything new but simply to call attention to some of the common causes of sterility which are usually overlooked, and the methods of treatment.

In the past few years there have appeared articles by Dr. Edward Reynolds, of Boston, which seem to treat this subject more thoroughly than any others I have seen. I have Dr. Reynolds' permission to quote freely from these articles.

At the outset we must distinguish between absolute and relative sterility. By the former we mean where there is not the slightest possibility of the patient becoming pregnant; for example, congenital absence of the uterus or ovaries; also following hysterectomy or double oophorectomy. With

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such cases this paper, of course, does not deal. Relative sterility includes those cases caused by some impediment which may be relieved. We may also make a classification of primary sterility where there are no children, and secondary sterility where there have been one or more children and then sterility due to some disease manifesting itself after the birth of the last child. For instance, if, just after marriage, a woman is infected with gonorrhea with a resulting salpingitis, and she has no children, she is primarily sterile. If, on the other hand, as so frequently happens, she has one child and then gonorrheal infection prevents further conception, she is secondarily sterile.

Many women become pregnant but abort before full term, so although they do not have children they cannot be said to be sterile, for conception takes place. It has been estimated that the male is responsible for the sterility in 30-40 per cent of nonfertile unions.

There may be no spermatezoa, azoospermia; a few slightly motile ones, oligospermia, or dead ones, necrospermia.

There may be few or no spermatezoa at one examination and a fair number at other times, so that one negative examination should not suffice. When a large number of active spermatozoa are found, our attention can be turned to a more careful examination of the female partner. A review of the gross and obvious causes of sterility will be omitted, as the object of this paper is to discuss that large group of cases in which on superficial examination the general practitioner can detect nothing abnormal. The spermatozoa in their normal habitat live in an alkaline medium. When suddenly they are deposited into the acid secretions of the vagina, there is a fight for life.

Normally the secretion of the vagina is very slight in amount and is largely neutralized by the alkaline semen before the acidity has had time to prove fatal to the spermatozoa. We can also easily imagine each spermatozoon surrounded by an albuminous coating which protects it during its journey through the acid vagina until it is deposited into the alkaline cervical canal. If then the small amount of normal vaginal secretion be inimical, how much more so would be a larger amount of normal or a small amount of abnormal secretion.

The vagina is also the outlet for the secretions, both normal and abnormal, of the cervix, fundus and possibly also of the tubes. A large proportion of apparently normal women have leucorrhea, in some slight, in others profuse. At coitus this leucorrhea is undoubtedly increased, and I believe in many cases is sufficient by the mere mechanical washing away to impede the entrance of the spermatozoa into the cervix. If added to this there should be a mild infection, gonorrheal or otherwise, increasing the destroying power of the leucorrhea, the likelihood of conception would be still less. After the spermatozoa have overcome the vicissitudes of vaginal existence, they enter the cervical canal. As stated above, I do not believe the small lumen of the cervix is as great a hindrance as we are wont to imagine, for when we consider the size of a spermatozoon, it is hard to see how any canal large enough to permit the escape of the menstrual flow should be a barrier to a microscopic organism.

In a retroverted uterus the cervix points downward and forward instead of downward and backwards, and it is possible or even probable that there is formed a sort of pouch behind the cervix where the semen is deposited and from which its entrance into the cervix is difficult. Those of you who have done gynecological pathology will recall that the cervix is lined by a single layer of epithelium and contains glands of the same cellular structure. The secretion of these glands is normally a thin mucus just sufficient to lubricate the parts. Frequently it is profuse and occasionally is dammed back into the glands and forms

small cystic nodules termed ova Nabothii. If for any reason, usually infection, the secretion becomes thick and inspissated, the cervical canal is plugged and a most efficient barrier to the progress of the spermatozoa is formed.

Although the gonococcus is the chief offender, almost any bacteria introduced from without may cause trouble. I firmly believe that tampons and other local treatments used in young girls frequently cause an endocervicitis with a resulting sterility. As the sterility is not manifested until after marriage, perhaps years later, the connection between it and the treatments is overlooked.

Apparently the body of the uterus seldom interferes with the upward progress of the spermatozoon.

Polypi or submucous fibroid large enough to fill the uterine cavity may offer some hindrance. We have learned that chronic endometritis is at least, pathologically speaking, very rare, for owing to the good drainage an acute infection rapidly clears up without going into the chronic stage. However, we frequently see a hypertrophy of the endometrium with hyperplasia and dilatation of the glands, and we are led to believe that this may have a relation to sterility, not by interfering with the upward progress of the spermatozoon but with the downward progress of the fertilized ovum.

In other words, when the fertilized ovum descends into the uterine cavity this thickened endometrium fails to form a proper decidua, and thus apparently from lack of nutrition the ovum is cast off.

Frequently this follows so soon after fertilization that the woman does not realize that she is pregnant.

Malposition of the uterus is also an important factor in abortion, possibly for reasons similar to those just given.

The relation between myomata and sterility is very uncertain. We see so many cases of large myomata which have not interferred with repeated pregnancies, that when we are seeking a cause for sterility and find a myoma we should not be too hasty to claim relationship. We are justified in supposing that a small submucous myoma would be more apt to interfere with impregnation or with the development of a fertilized ovum than would a larger tumor, interstitially or subperitoneally located.

The tubes have long been recognized as the probable seat of trouble in many cases of sterility.

The lumen of the tube is so small that even congestion of the mucosa would be sufficient to create at least a temporary if not permanent obstruction.

Angulation from adhesions so delicate that they cannot be detected by bimanual examination is very common. In some cases the tube is so twisted that it is almost impossible to pass the smallest probe and yet the distortion is not recognized until the abdomen is open.

We have all seen cases where there were fine cobweb adhesions about the fimbriated end, which did not interfere with the patency of the tube. Yet it does not require much imagination to suppose that this slight interference with the freedom of the tube might be amply sufficient to disturb that accurately balanced relationship between it and the ovary. Just what relation the ovary itself bears to sterility cannot be definitely determined.

Chronic inflammation, the thickened tunica externa and the multiple cysts have all been blamed.

A few years ago such ovaries were considered a menace to health and were removed. Thus hundreds of women, relatively sterile were rendered absolutely so. Today the tendency is to treat them conservatively, and I believe as that tendency increases more women will become pregnant.

Just a few words as to treatment. The general health of our patient should always be considered. Gross errors should be cor-

rected. The under-weight, anaemic woman should be built up.

Abundant rest and in so far as possible a mental condition free from worry should be encouraged.

Correct diagnosis is the first and indispensable step in successful treatment.

Anything tending to produce or increase pelvic congestion should be strictly avoided. Too frequent sexual excitement, whether of physical or mental origin, should be discouraged. It is wise for the husband and wife to sleep in separate beds.

A thorough disinfection of the vagina is usually indicated and can certainly do no harm.

The vagina can be cleaned with green soap and water, and then with the patient in the knee-chest position, swabbed with tincture of iodine or one of the silver preparations.

There should be a free passage through the cervical canal doing a plastic operation if necessary to maintain a good opening.

In those cases where the cervical secretions are hard and tenacious, thorough swabbing of the canal with carbolic and alcohol, or the application of the actual cautery, as advocated by Hunner for leucorrhea, is advisable.

In congested cervices with profuse leucorrhea of normal appearance, depletion by tampons of glycerin or ichthyol and glycerin is indicated. As previously stated, chronic endometritis is an uncommon condition, and when it does exist it can be best treated by keeping the cervical canal patulous, providing the uterus is in good position.

I am not in favor of swabbing out the whole uterine cavity in a blind, haphazard way. Upon purely theoretical grounds I believe it is possible that in such manipulations sufficient reaction could occur to close off the minute openings of the tubes into the uterine cavity and thus make absolute sterility which might possibly have been only relative. The sterilities of tubal and ovarian origin offer the greatest difficulties.

In the absence of a definite lesion of the tubes or ovaries upon bimanual examination, I do not believe that a laparotomy, simply with the hope of finding a cause, is justifiable. If for any other reason the abdomen of a sterile woman be opened, then of course any abnormalities of the adnexa should be corrected upon the slight chance that it might relieve the sterility.

I am only too well aware that I have presented nothing new, but simply wish to impress the fact that when we have casually examined a sterile woman and find no gross lesion, we are not justified in dismissing her with the assurance that her organs are perfectly normal, or possibly doing a dilatation and curettage.

DISCUSSION.

Dr. G. L. Hunner, Baltimore, Md.—Dr. Griffith has very well said that this branch of medicine is changing rapidly from the empirical to the scientific stage. However, with any condition, that has so many factors that may play a part, we are bound, for a long time to come, to have a great deal of empiricism in our treatment.

Dr. Griffith has been over the ground so well that I hardly feel justified in taking up much time to discuss the various phases of sterility. I would like to emphasize, however, the great error that we have been in as a profession for many years past. If I could impress that one phase on this body of general practitioners, and surgeons, I should feel that my discussion was worth while. I, as a gynecologist, see women so often who have had repeated operations to cure them of sterility. Perhaps been sent from one clinic to another, or from practitioner to practitioner, and not infrequently have had two or three curettings before I see them; sometimes a suspension of the uterus and various other gynecological operations. On inquiry I find that the conditions of the patient's husband as regards spermatozoa has never been investigated. It seems to me just a little short of criminal for us to continue in that sort of practice.

When Dr. Griffith said that we now recognize that sterility is due to the male in 30 to 40 per cent of cases. Dr. Miller, of New Orleans, said: "That is rather high, isn't it?" I believe that our figures are getting higher as we investigate the male more often. I should find, I think, between 40 and 50 per cent in which the sterility is due to the male, or in which the male is sterile.

Of course we, in the large cities, have patients come from a distance for treatment for sterility, and it is not convenient to get a specimen from

the husband for examination. I think if we can find some error in the woman's condition, we are probably justified in doing something for the woman, and we should get a reliable certificate from someone that we know concerning the husband's spermatazoa. It does not do to say that the husband has been examined and has been found O. K. You know how prone we are to be human, and physicians are sometimes rather careless and not always scientific about their investigations. Because the husband says that he has not had gonorrhoea or diseases of the genitals, and because he looks well, is no indication whatever that he is fertile.

So I would like to emphasize that one point: that we should never dilate and curette a woman or do any operation for her without finding out the condition of the husband, unless she has some very gross condition that seems to be the cause of sterility.

I see many women whose chances of fertility are far less because they have had a dilation and curettage. In these cases I make a practice never to curette unless the patient has profuse bleeding, when curettage would give material for a diagnosis and possibly help the condition. The curettage does harm, scratching the mucous membrane, and unless you leave gauze or something to keep the bare walls of the uterus apart, the uterus walls grow together, and the woman has a stenosis, which leaves her less liable to become pregnant than she was when she came.

Dr. A. S. Miller, New Orleans, La.—I am thoroughly in accord with what the doctor has said, and will speak a few words on the treatment. We are now, I believe, going to the other side of the question and stating that the cervical diseases have very little to do with it, or that the percentage is much less than we formerly thought. I think not. I think if you rule out ovarian disease or fibroids that we find malformation. For the past four years I have been using the extra-uterine stem, and have been able to relieve such a large body of selected cases that I am receiving better and better effects. I know one or two cases that have had amenorrhoea from this curettage. They may have a faulty mucous membrane to begin with, and you do harm in those cases and render the woman positively sterile.

I have been using the Baldwin-Gears stem. It fits up to the body of the cervix, does not extend to the vagina, and it settles the trouble, in the majority of cases, where there is ovarian disease.

Dr. C. E. Cantrell, Greenville, Texas.—Just one class of cases I would like to speak about: The cases due to infection inside of the abdomen that are not gonorrhoeal infection. Gonorrhoea has been blamed a good many times, and it does stop up the tubes, but there are other ways to render a woman sterile besides stopping the tubes. The class of cases I wish to call attention to are those who have chronic appendicitis with extravasation from the bowel, making localized peritonitis down behind the uterus, the lowest portion of the peritoneum will become inflamed and this infection will spread out over the peritoneum and ovaries and render it so thick you get multiple cysts of the ovary.

You know girls don't die with appendicitis nearly as often as boys, because infection in the female pelvis will be taken care of much better than in the male pelvis. A girl has appendicitis for years and gets married and is sterile. She had better be operated upon for the old appendicitis and remove the degenerated portion of the ovaries, and I have seen them become fertile.

INTRACRANIAL HEMORRHAGE DUE TO TRAUMATIC RUPTURE OF ARTERIA MENINGEA MEDIA—REPORT OF SIX OPERATED CASES WITH ONE DEATH.*

By Lucian H. Landry, M.D., F.A.C.S.,
Assistant Demonstrator of Operative Surgery; Instructor in Clinical Surgery, Tulane University; Junior Surgeon, Touro Infirmary, etc., etc.,
New Orleans, La.

It has been my good fortune recently to see six very severe cases of intracranial hemorrhage, with cerebral compression, associated with injury to the middle meningeal artery, in which prompt surgical intervention was carried out and rewarded with the most gratifying results to both the patient and the surgeon in all the cases except one (Case 5).†

The history of cerebral compression, from the point of view of its origin, its seat and mechanism, was for a long time neglected.

Malgaigne and Gosselin even professed that the lesion had no special symptom complex, contrary to L. J. Sanson, Nelaton and Chassaignac, who admitted that the characteristic sign of compression from an extradural hematoma was a hemiplegia of the opposite side.

The surgery of these hematomata was practically unknown and the anatomical lesion was only described in treatises on pathological anatomy and possessed for the clinician scarcely more than an academic interest—until Gerard Marchant published

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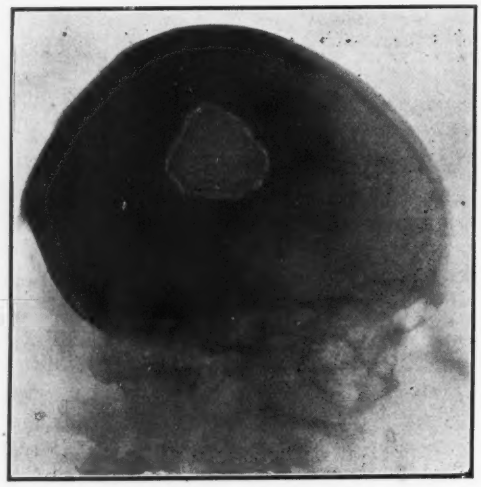
the results of his original research in a memoir, "Sur les dechirures de l'artere meningee moyenne," which appeared in the *Revue de Chirurgie,* Paris, in 1880, and followed the year after by his inaugural thesis, "Des epanchements sangine intracraniens," which are now recognized as epochtual contributions to the literature of the subject.



Case I.

The subsequent publications of Tillaux, Duplay, P. Vogt, Wiesmann, Formad, Roberts, Gross,, Jacobson, Nancrede, Steiner, Plummer, Kronlein and others, too numerous to mention, not only confirmed Marchant's fundamental work, but molded and developed this most interesting phase of cranial surgery to its present phase of clinical lucidity and technical efficiency.

In 1880, Marchant stated: "The intracranial hemorrhages are observed frequently enough in fractures and other injuries of the skull; they constitute a complication of skull traumatisms accompanied by definite and precise symptoms, so much so, that a clear-cut clinical picture is presented which furnishes the basis of an equally well defined and efficient therapeutics." It is to Marchant's lasting credit that this "clinical picture" and "well-defined therapeutics" were recognized and brought to light out of the shadows that hung over and darkened this phase of cranial surgery in his day.

Bayard Holmes, in opening his chapter on Compression of the Brain Due to Traumatic Rupture of the Middle Meningeal Artery, says:

> The surgery of the brain is generally mournful and discouraging, but here comes almost the only exception. This complication or result of both simple and compound fractures of the vault and of the base of the skull is of the greatest clinical importance. Its importance is due to the terrible danger in which the patient is placed and to the unfailing relief which follows prompt diagnosis and rational treatment. Otherwise, nearly all such cases die of what appears at first to be possibly a trivial injury—or, if they live, they suffer permanent impairment of the function of the side of the brain compressed, and what is worse, a most disastrous numbing of the intellectual faculties. It is in this respect analogous to incarcerated hernia or intussusception, which demands unerring diagnosis and immediate surgical treatment. No time can be lost.

In a few cases, hardly as many as one-tenth of all ruptures of this artery, the hemorrhage stops, the symptoms of compression partially subside and the patient continues to live. These cases cannot be called recoveries. The damage done to the brain is irreparable, the strength of the paralyzed side never completely returns. The psychic symptoms are often melancholy, and the intellectual impairment most deplorable.

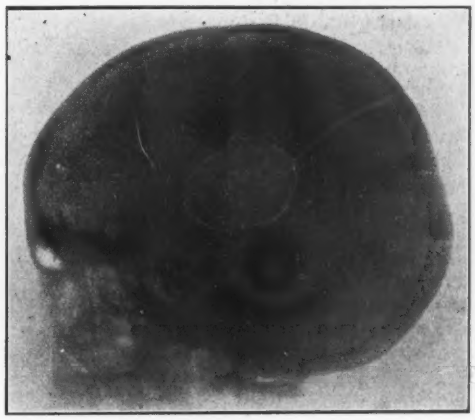
Cushing estimates, from a large number of records, that 90 per cent of these meningeal apoplexies prove fatal if unrelieved surgically, sixty per cent of them dying in the first twenty-four hours. Of a large series of operated cases, 67 per cent recovered, a percentage which would be much larger were it possible to secure prompt intervention before the onset of medullary symptoms, in the pa-

†Three of these cases appeared in my own practice, while two cases were operated by Dr. R. Matas, in which it was my privilege and pleasure to assist, and the other operated by Dr. R. E. Stone, to whom I extend my thanks for the privilege of incorporating their cases in this report.

tients in whom the extravasation takes place rapidly.

A study of the statistics of intracranial hemorrhages pleads eloquently in favor of operative intervention in these cases. In 257 cases contained in the memoirs of Wiesmann, 147 were treated expectantly and 110 by trapanation—with 16 cures and 131 deaths by the expectant method, against 74 cures and 36 deaths by operation. Custodis contributes 108 operated cases, with 86 recoveries and 22 deaths, a mortality of 20.37 per cent. Nancrede reported 40 operative cases with 24 successes and 16 deaths. Bergmann, at the fourteenth German Congress, spoke of 22 cases trephined for cerebral compression due to rupture of the middle meningeal artery with 20 successes; this is an excellent record, and in itself should be most convincing that the operative procedure is the only procedure that should be considered in this class of cases.

The great majority of extradural hematomata occur under the lateral aspect of the skull, and, more particularly, in the temporal region. The extravasations are more or less circumscribed, for only when one of the main branches of the vessel or the trunk itself has been injured, will there be a widespread escape of blood. The terminal twigs of the artery, inasmuch as they do not deeply groove the bone, and have but slight communication with its inner surface, are rarely the source of extensive bleeding. Kocher has divided the phenomena attending compression into four groups, dependent upon the circulatory disturbance reached by the abnormal intracranial pressure. The first group of symptoms correspond to a mild grade of compression, the cerebrospinal fluid is driven out of the ventricles, moderate venous stasis results; the symptoms are moderate, a mild headache is about all that is noticed. The second group of symptoms correspond to a greater venous stasis; less blood flows to a part; headache, vertigo, restlessness, excitement and delirium may exist. The face may be slightly cyanotic, if the venous stasis is at the medulla, then, a slowing of the pulse will be noticed. The third group of symptoms correspond to the anemia of the brain. The high tension pulse is noticed as the compensatory vasomotor mechanism acts. The pulse rate is slow, optic disk choked, facial cyanosis marked, respiration is stertorous. The fourth group corresponds



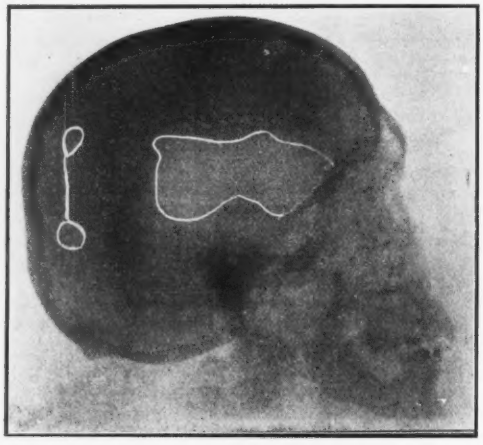
Case II.

to the failure of the arterial compensation. The action of the heart and lungs becomes irregular, the pupils dilate, pulse becomes rapid, coma increases and death occurs.

Slight hemorrhages do not cause symptoms of compression, neither do slight depressions of the cranial bones. Before symptoms of compression appear the cranial contents must be impinged upon to a very considerable extent. On the other hand it has been demonstrated by experiments that a clot between the dura mater and bone, equalling one-twelfth the capacity of the cranium, will produce coma and death within a few hours. (Ashurst.)

E. Vincent states that a traumatism of the temporo-parietal region produces a fracture of stellate shape, usually with several triangular fragments which are driven into the cranial cavity. The dura mater is pushed back and one of the branches of the

middle meningeal artery may be torn by the point of one of these fragments. The blood escapes between the skull and dura mater, which may be crowded back in the "detachable zone" (first described by Gerard Marchant), and the outcome is an extradural extravasation, often large enough to threaten the patient's life.



Case III.

According to Scudder the sources of intracranial hemorrhage, whether from the middle meningeal or its branches, from the middle cerebral arteries, from the veins of the pia mater, from the sinuses of the brain, or from lacerated brain tissue, cannot be easily differentiated short of operative procedure. However, he states that the most common cause of traumatic intracranial hemorrhage is the torn anterior branch of the middle meningeal artery. The next most frequent source is the posterior branch, while Cushing states that bleeding in the free space between the dura and arachnoid (subdural or intermeningeal hemorrhage) is possibly a more common consequence of injuries than the extradural form.

In fifty-five observations of Gerard Marchant the hemorrhage was due to middle meningeal rupture in thirty cases; in sixteen cases to the rupture of a sinus; in eight cases the source of the hemorrhage was found in the vessels of the pia mater, and in one case to the veins of the diploe.

Enderlen discusses the difficulty of the diagnosis of meningeal hemorrhage in those cases which are not typical, according to the clinical description of textbooks, more particularly those cases in which the hemorrhagic focus is inspected or actually looked for on the opposite side, according to the existing cerebral phenomena at the extremities; whereas it is really located on the same side.

Three corresponding personal observations from the clinic in Basel serve as an illustration. In the first case trephining was unsuccessfully performed upon the opposite side only; the patient died and the autopsy showed the meningeal hemorrhage on the same side.

In the second and third case, an ineffectual trephining operation was likewise performed upon the opposite side, but this was immediately followed by opening of the skull on the same side, with discovery and evacuation of the hematoma, resulting in the recovery of the patients.

The author inclines to the assumption that meningeal hematoma, under certain conditions, may compress the opposite side of the brain more than that in which it is located, thus readily accounting for the collateral paralysis.

Diagnostic puncture or capillary trephining of the skull, according to the methods of Mass, Middeldorpff, Guns-Spitzka, Souchon, Schmidt, Payr and Kocher, are all ineffectual and of little or no value, for the reason that thickened bloody coagula may easily escape aspiration through a fine needle. Exploratory tapping of the skull (Collier's method) is considered as much more reliable.

The clinical picture is one of cerebral contusion with compression and unconsciousness. Medullary symptoms are invariably present, blood pressure is high during the

early stages, pulse slow, respiration labored, and as stupor passes into coma, unless the process is interrupted or its pressure effects relieved, the Cheyne-Stokes type sets in and finally the paralytic stage of compression supervenes.

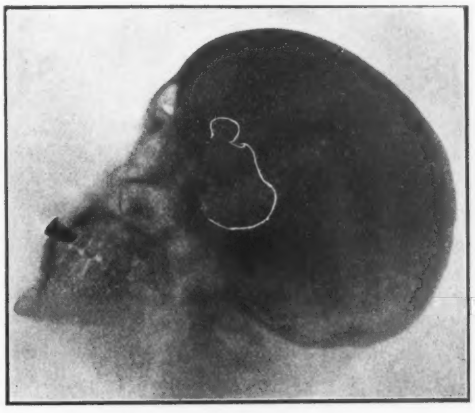
As a rule, the injury which has led to the vascular lesion has been sufficient at the same moment to so stun the patient that some grade of unconsciousness from concussion has been produced. These primary symptoms may pass in the course of a more or less brief space of time and the patient's mental activity become in a degree restored. Then, after a few hours of relative freedom from evidence of marked cerebral disturbance, headache and possibly vomiting appear, and in a short time the patient again sinks into a stupor. Focal symptoms may have been observed, however, before this develops. All the textbooks insist upon this "interval of consciousness" or "free interval" or "period of lucidity" as possibly the most important differential symptom of epidural hemorrhage. This was not observed in my first two cases, but was very characteristic and pronounced in the others.

Irregularity of the pupils is common. The pressure of the clot against the hemisphere is said to cause an early narrowing of the pupil on the same side, and, later on, a dilatation. This dilatation in the late stage may affect both pupils, but even then the pupil on the side of the lesion remains the wider. (Hutchinson pupil.)

The so-called expectant treatment of cranial lesions consists of: 1. Shaving the head. 2. Cleaning all orifices (ears, nose, mouth). 3. Putting the patient to bed in a still room and in a semi-recumbent position. 4. Applying cold to the head (ice helmet bag, cold compresses or Leiter's water coil). 5. Mild laxative given to diminish the blood pressure. 6. Placing patient on a very light or restricted diet and all stimulants denied. Patient should not be left alone for fear of psychic symptoms, which are more apt to show themselves in the first week.

TREATMENT.

When there is compression from any cause this cause must be removed; if from depressed bone, the bone must be elevated; if from epidural hemorrhage, the artery must be tied and clots evacuated; if from sub-



Case IV.

dural hemorrhage, decompression and drainage.

Spinal puncture is not necessary to make a positive diagnosis and should be discouraged, for, if the hemorrhage is very profuse and active, as is the rule in most of these cases, there is danger of the medulla and posterior lips of the cerebellum being forced or wedged into the foramen magnum by intracranial pressure when the support of the cerebrospinal fluid is removed.

Notwithstanding the most terrible injuries of the skull and brain, many such cases, if given the proper attention, will go on to a good recovery of which my second case is a most striking example. It is safe to say that in any serious cranial injury in which unconsciousness has been present from the first, subdural bleeding is taking place.

LOCALIZATION.

The older authors expended a considerable

amount of time and no end of labor in devising ways and means to establish an accurate and trustworthy procedure or scheme to assist us in cranio-cerebral topography. Hence the method of Chipault, which was held in high esteem by the French schools. Likewise, the procedures of Broca-Championiere, of Poirier and Kocher; in infants,

Case VI.

the method of Lannelongue-Mauclaire was highly thought of. The method of Chiene was advocated for its simplicity; likewise, that of DeVilbiss. Taylor and Haughton also describe a procedure based on measurement. Sir Victor Horsley devised an instrument for this purpose which he calls a cyrtometer, and there are numerous other methods which have been less popular. Kronlein's is probably the best and most acceptable of all the methods offered. This is the method we lay more stress on and use in teaching in the operative surgery laboratory of Tulane University. The student should also familiarize himself with the recognized landmarks of the skull as described by Broca. The *pterion* is a point on the side of the skull one and one-quarter inches posterior to the external angular process, on a level with the roof of the orbit. At the pterion, the middle meningeal artery is found passing forward. An old but well-recognized method of locating the pterion is to drop a perpendicular from the bregma to the middle of the zygoma, then draw a horizontal line back from the external angular process; at the intersection of these two lines will be found the Sylvian point, where the pterion is situated.

All these methods of cranio-cerebral topography have, to a large extent, lost their importance, as the surgeon today explores the brain through a large aperture or windows by craniectomy and not by "the old-fashioned trephining," and all that is necessary is a general topographical knowledge of the region involved.

The most encouraging and noteworthy feature in studying these cases, particularly the second and third case, is, that despite the long period of unconsciousness (five and six days respectively) when the patients had to be fed by nasal tube, the rectum and bladder emptying involuntarily, still they cleared up completely and exhibited as active and perfect cerebration as before the accident.

CONCLUSIONS.

The injury in the cranial vault itself, when this exists, is an unmistakable guide to the seat of hemorrhage. The majority of the cases are associated with marked fracture. It is only when there is no external lesion of the vault itself that Kronlein's and other guides to the pterion are really necessary for the localization of the artery. However, a previous training in the exact localization of the pterion is quite valuable, and it is so simple it should be easily remembered.

Capillary trephining is of little or no value, and should not be resorted to.

In concluding, I would like to add my voice to the cry for immediate exploration and decompression in all doubtful cases. The latter-day technic of cranial surgery is such that a decompression operation will pos-

itively add no more risk to life, and, in most instances, will bring to a happy termination what would have otherwise been a fatality.

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CASE REPORTS.

Case 1. E. L. R., factory superintendent. Age 40. On January 20, 1913, at 1:00 p.m. was struck on the right side of the head with an iron ball, about the size of a lemon, weighing two and a half pounds. The ball was thrown from a distance of fifty feet. He was unconscious for three or four minutes. The first thing he noticed on regaining consciousness was that his entire left arm was weak; had no muscular control whatever; sensation abolished; felt as though his hand was asleep; no difficulty with the lower extremity. Was brought to the Hotel Dieu thirty minutes after the accident. Complained of headache and vomited two or three times. A small incision was made in the contused area of the scalp by the house officer to verify the diagnosis of depressed fracture.

At 4:00 p.m. was taken to the operating room. A liberal horse shoe incision was made around the contused area, the skull exposed and a depressed fracture found in the tempero-sphenoidal region about the size of a silver dollar or possibly a little larger. Three trephine openings were made around the depressed and partially comminuted bone. On removing these buttons a large amount of clot oozed out. The depressed fracture was elevated and quite a large, firm, lens-shaped clot was seen to lie over the lower Rolandic area, spreading out and dissecting its way between the skull and dura, attaining an area of fully three inches in diameter. Clot removed and the severed and bleeding posterior branch of the middle meningeal artery exposed. A fine needle armed with silk was passed around either end of the severed artery, taking in a bite of the dura. This stopped all further bleeding. All clot was cleared out and the skin flap sutured with silk worm gut. A small gauze drain was inserted through the original exploratory incision.

Two hours after the operation, he noticed he had a little muscular control in the arm. Sensation greatly disturbed, said the iron bed post felt like ice to his hand. From 2:00 a.m. on the muscular control and sensation became greatly improved. At noon, January 21, muscular embarrassment is limited to the fingers; sensation in the palm and on dorsum of hand is perfectly natural. January 24, sensation returned on little finger up to the first phalangeal joint. January 25, sensation improved, particularly on dorsal surface of fingers; palmar surface still gives sensation of extreme cold. Muscular control in thumb and index finged improved. January 26, index finger, muscular control greatly improved; slight improvement in thumb; sensation in little finger completely returned. January 27, thermic sense in thumb completely restored but still has a feeling of numbness. Index finger sensation good up to second phalangeal joint. Ring finger, sensation good up to midway between first and second joint. Mid finger same as ring finger. January 28, sensation completely restored. Left hospital January 29, scalp wound perfectly healed; improvement has been steady though gradual. Still has a disturbed stereognostic sense.

Case 2. W. R., age 14 years. At about 5:30 p.m., June 18, 1914, patient fell from a tree, a height of approximately 30 feet to a brick pavement, striking on his head. Was brought to the Touro Infirmary about two hours after the accident. Was in a deep stupor, which condition the mother said he had been in since the injury.

Vomited frequently, bowels and bladder acting involuntary; pupils equal and react to light and

*The word trephining has been used considerably throughout this paper, but it is not meant in its true term, as trephining is more or less a generic term and is seldom if ever resorted to.

accommodation; no bleeding from mouth, nose or ears. No ecchymosis about the eyes; respiration slow and stertorous. Pulse, 130; volume fair. On examination a bulging mass was seen filling the temporal fossa; this appeared to be a hematoma. No depression or fracture could be felt through the scalp. Fifteen minutes after admission, was taken to the operating room. A liberal horse shoe incision was made in the left temperosphenoidal area. On peeling the periosteum back, a linear fracture was seen extending well down toward the base of the skull. A linear incision was made from the apex of the horse shoe extending well beyond the mid-line of the cranium to trace the fracture. The skull appeared to be completely cracked across the vertex. A decompression was done. Epidural hemorrhage active; posterior branch of the middle meningeal found ruptured; this was secured by suture. Dura found to be very tense; on incision a large amount of clot and fresh blood escaped, with some brain tissue. The dura was incised freely, and the bone plate removed. Soft parts brought together with silk worm cut, leaving wide interspaces for drainage; iodoform gauze drain put in either angle of the wound. Patient was extremely restless, though unconscious for five days following the operation; pulse 120 to 140; temperature 101 to 103. Morphia given freely and 5 per cent glucose proctoclysis.

One June 24, six days after operation, temperature 101-6, pulse 110, restlessness subsiding, and able to take nourishment by mouth.

From then on the boy made a rapid recovery, and was free of fever July 2, although pulse still remained about 100.

July 7, an eruption was noticed over entire body; temperature 101. July 8, marked ulceration found inside of mouth and lips. Transferred to medical service. This was most probably hemorrhagic measles.

Discharged July 25.

Case 3. (Kindness of Dr. R. Matas.) R. O., age 36. Flagman by occupation.

On November 6, 1914, while alighting from a street car, patient was struck by an automobile at 11:00 a.m. and picked up unconscious. He became conscious in a few minutes. Was brought to the Touro Infirmary, but, as he felt no pain or exhibited no symptoms, he was put to bed for further observation. Pulse 80, strong and regular. Blood pressure 104 m.m. At 2:30, patient complained of a severe right sided headache. When seen at 4:00 p.m., patient was in a semi-comatose condition, which was rapidly deepening into coma. A large hematoma was found on the right side of the head; pulse 50 and very strong, breathing deep and stertorous; periods of complete lapse of consciousness. The pupil on the right side was enlarged, but reacted to light sluggishly.

At 5:00 p.m., the patient was prepared for operation, being totally comatose; right pupil typical Hutchinson pupil; left pupil normal; face on the right side showing paralysis. At time of operation pulse was 40, respirations 16, blood pressure 140.

Operation (by Dr. R. Matas, assisted by the writer): A large semi-circular flap was made in the right temporal region, including the entire hematosed area. On reflecting the flap, it was found that the hemorrhage had already dissected up the pericranium from the skull, exposing a large linear fracture which extended obliquely from behind upwards beginning at the pterion and extending back in a line almost parallel with the fissure of Sylvius, terminating at a point about two inches from the external occiptal protuberance.

Four perforations were made with the Hudson drill and burr, two on either side of the linear fissure, the two lowest corresponding to the temporal end of the fracture. With the Hudson-Devillbis and Rongeur, a large square piece of skull was removed which at once released the underlying clot. The whole squamous shell of the temporal was removed, with a view of exposing the origin of the middle meningeal.

The main trunk of the artery was found completely severed and bleeding on the dural surface. The distal end was easily secured by a fine silk suture, but considerable difficulty was encountered in securing the proximal end, under the greater end of the sphenoid.

All clots were removed. Two large openings were made, one on each side of the fissure, and connected together by a channel, to favor drainage. A rubber tube was inserted in each hole. An iodoform gauze pack was placed in the temporal fassa and the scalp wound closed with silk worm.

As soon as the clot was removed, the pulse went up to 80. The right pupil, which had been dilated, became normal.

A few days after operation, the patient began to show sluggish motion in both limbs of the right side. He was fed by nasal tube every four or five hours, and later by stomach tube. He voided and defecated involuntarily. On November 10, patient began to show signs of returning consciousness, but he did not utter a word until November 12—*six* days after the operation.

Case 4. (Operated by Dr. R. E. Stone at Touro Infirmary, and reported by kind permis-

sion of the operator.) December 11, 1914. Mr. C. R. White, male, age 19, occupation, brakeman.

Two days before admission patient was struck in the head by an intoxicated man who used a pick-axe as a weapon. He was found unconscious immediately after the accident, bleeding profusely from a wound in the left side of the head, just above the pterion. He was treated expectantly the 48 hours following his accident. When first seen by Dr. Stone (two days after the accident he was still unconscious and with a purulent discharge from the cranial wound. Temperature 100, pulse 74, and respiration 24. An X-ray picture was taken and was negative to fracture. Lumbar puncture performed, the cerebro-spinal fluid was quite red and seemed to be under great pressure, running 140 drops per minute. Blood pressure 138. Hutchinson pupil; right arm and leg showed slight weakness. Bladder and rectum emptied involuntarily. The patient, however, was able to swallow.

A curved incision was made just above the traumatized spot, which was later joined with a vertical incision at the lower angle. On peeling back the periosteum a punched out piece of bone about the size of a five-cent piece was found driven into the brain substance.

A liberal window was made in the skull and on removing the depressed bone an active hemorrhage was encountered. This was found to be from the anterior branch of the middle meningeal. The distal end was easily tied, but considerable trouble was experienced in getting the lower or proximal end. A large clot was found between the skull and dura. Wound closed by interrupted suture; drain left in lower angle.

Was totally unconscious for four days after operation, being fed by stomach tube. Drain removed on sixth day, from which time the patient has made a very satisfactory convalescence.

Case 5. (This case was turned over to me through the kindness of Dr. Urban Maes, in whose service the patient was admitted to the Charity Hospital.)

G. S., white male, age 24, laborer. Admitted December 17, 1914. While helping to carry a piece of timber 50 feet long, 6 inches wide and 2 inches thick, the other end was dropped and his end flew up and struck him in the left side of the head, throwing him a distance of 20 feet.

He was unconscious for ten minutes, but on arrival of the ambulance was able to talk. Bleeding was noticed from the left ear, but otherwise the patient made no complaint. No bleeding from nose or mouth; no conjunctival injection; slight contused wound just over the ear; pupils equal and react to light. Pulse 80, regular, good tone. Respiration 20. Three hours after accident patient vomited blood and appeared to be drowsy, respiration deeper.

At 10:00 p.m. (four hours after accident) left pupil greatly dilated and does not react to light. Right pupil normal. Skin cold and clammy. Respiration 12 per minute, slow, deep, and stertorous. Pulse 50, regular, full. Reflexes absent; patient cannot be roused.

At 11:00 p.m., without anesthesia, a liberal horse shoe incision was made in the left temporal region. On exposing the skull, a small linear fracture was seen radiating from the mid portion of the temporal bone toward the base of the skull. A liberal piece of temporal bone excised, which at once exposed a very large clot covering the entire temperosphenoidal area and extending well down into the middle fossa.

The brain was seen to be markedly compressed, being fully three inches from the skull when clot was removed. This was soon overcome, however, and when the clot was entirely cleared out, the dura soon regained its normal relation to the skull.

The anterior branch of the middle meningeal was ruptured low down, close to the bifurcation, which was sutured with some difficulty; the posterior branch was also severed, but was easily controlled.

As soon as the pressure of the clot was released, the pulse rate jumped from 50 to 120, with a good volume. Toward the end of the operation the volume dropped and rate increased. Respiration increased to 50 per minute. At the close of the operation the patient had a convulsion on the table, which lasted four minutes. Left pupil a little less dilated, but failed to react to light.

One hour after the operation, pulse 112, slightly irregular, respiration 60, irregular, shallow, and of a jerky character. From then until 5:45 a.m. (five hours after operation) respiration became more embarrased, shallow and irregular, when all respiratory movements stopped.

A partial autopsy only was granted. The brain was removed very carefully by Dr. Mattes, Assistant Pathologist, the only thing of note presenting being on the under surface of the left cerebral hemisphere, just lateral to the hippocampal sulcus, where a semi-circular discoloration is found in the area of the hippocampal gyrus. The color of the cortex is here brownish-black, and the area measures 1 c.m. in widths.

This is evidently traumatism to the cortex due to the marked compression the brain was subjected to. The cause of death, clinically, was respiratory paralysis due to compression.

This case was a severe disappointment, as the brain regained its normal condition almost immediately upon removal of the compression, and we had every reason to believe that he would recover.

Case 6. (Dr. Matas' case.) R. T., age 20, clerk. On May 23, while playing baseball, was struck by a thrown ball in the left temporal region and knocked down. He did not lose consciousness, but got up and dressed and walked to a nearby automobile. Five minutes later, on his way to the Touro Infirmary, he had a slight convulsion which lasted about a minute. Upon his arrival at the Infirmary, he was unconscious; both pupils equal and reacted to light and accommodation, although the left was sluggish. Ten minutes later he had a violent convulsion of the upper extremities and face, which lasted a minute and a half, during which he was extremely cyanotic. Pulse strong, full and slow. Blood pressure 145. Left temporal region is red, swollen, puffy and oedematous.

Through a straight, perpendicular temporal incision, a large segment of the temporal bone was found to be in fragments and removed. The middle meningeal artery was found to be ruptured near its origin and very inaccessible. It was finally ligated with fine silk, but a gauze tampon was left at a point near its origin as an additional precaution.

The boy made a rapid, uneventful recovery, and left the institution on June 8, two weeks after the injury.

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*Radiograms (retouched) made by Dr. E. S. Samuel, Radiologist to the Touro Infirmary, New Orleans, La.

2255 *St. Charles Ave.*

DISCUSSION.

Dr. Urban Maes, New Orleans, La.—Mr. Chairman and gentlemen: I think the important thing, aside from the interesting details of Dr. Landry's paper, are the necessity and appeal he has made for the exploration in all these cases of cranial surgery. Here is the period of unconsciousness, gradually deepening coma—coming on as a sequence in nearly all of these cases. In that type it is imperative that we should always look for haematoma.

Another class, with fractures of the vault and of the base, in which the decompressions are indicated, despite the fact that there are no focal signs of hemorrhage. Concussion of the brain means nothing. It does not convey to anyone's mind any distinct pathological state. These injuries are true contusions, and whether they be of the vortex or of the vault, a certain amount of inflammation is going to occur with cerebral concussion. The brain cannot swell inside the dura or the skull—which is a closed box; consequently all of our brain injuries that have any severity of symptoms whatsoever, or where we are justified in suspecting fracture of the vault or base, had better be decompressed, because there is almost always small hemorrhages and extravagasation, so that decompression is indicated much more frequently than has been our habit of doing in the past. We employ the expectant treatment. There is absolutely no such thing as concussion. They are all contusions, just as much so as a black eye, and at the autopsy table you will see exactly the same phenomena as in contusions of any other part of the body, and on account of the structure of the skull and brain it refuses to tolerate this reaction, and you had better decompress and find nothing than leave your patient alone and let him die.

The hemorrhages from the middle meningeal artery all have to be relieved by operative interference, and are fairly typical.

Dr. Jere L. Crook, Jackson, Tenn.—We appreciate the respectful attention which has been shown us by the other side of the house. If I may be pardoned for adding one more to this distinguished group over here, I would say I have been interested in the subject of brain surgery for many years. To my lot have fallen many cases of traumatic origin. The term "concussion of the brain" is applicable to the subject under discussion, because that is always the result of the blow. What we deal with is the contusion resulting from the concussion. If that blow which produces the injury be of sufficient strength to rupture an artery in the brain, we have the condition described by the essayist. Some years ago a little negro boy about ten years of age used very poor judgment in coming in contact with a railroad train, and was knocked off the right-of-way. He picked himself up and walked home, and I was called to see him. I put a bandage around his head and told him to come on and get into the buggy and we would go to the office and I would sew the wound up. We did not have very good streets, and we were jolted and jarred very considerably, and by the time we got there this little negro had fallen unconscious against my arm. Operating at once I found a rupture of the middle meningeal artery. I shelled out a blood clot, tied the artery, and the little fellow made a good recovery.

Dr. Burns, Memphis, Tenn.—I have enjoyed Dr. Landry's paper very much, and endorse everything he said, and will say for him that in my service at the City Hospital over ten years ago, I practically abolished the idea of the expectant treatment of cases that had had an interval—so-called free interval or a momentary period of unconsciousness, followed by the free interval, and then lapsing into unconsciousness or possible coma.

It is the injuries of the middle meningeal artery that give us compression. In many, many instances—I should say probably not the majority, but in a large per centage of cases, they give us pressure where we have no fracture. These are the insidious cases that we should watch.

I shall not discuss concussion only to say I think that has been read out of the book and ought not to be left there. It should be wiped out of the books.

Dr. Russell E. Stone, New Orleans, La.—Dr. Landry demonstrates the necessity of operating

these cases, and not running along on the expectant plan, and trusting to ice bags, because these patients are told to go home, and the clots get larger and larger, and in a few hours the patient is unconscious. These cases of Dr. Landry's make immediate recovery, and exploratory operation of the brain is not any more injurious than going into the abdomen. I believe that a lumbar puncture should be made so as to determine the present and amount of intracranial pressure. This should be a routine procedure in every case of suspected intracranial injury.

Dr. J. N. White, Texarkana, Texas.—We have had some experience along this line, and the sooner we relieve the compression the quicker we cure all concussions.

Dr. Landry (closes)—I am sorry Dr. Crook had to leave before I had a chance to close the discussion. In the case he reported, he claims the rupture of the vessel occurred in his buggy while on the way to his office, some time after the traumatism. This is very unlikely; the rupture occurred at the time of the traumatism, but the hematoma did not attain proportions enough to cause symptoms of compression until he was on the way to his office. It was not the jogging of the buggy that caused the rupture of the vessel, but the initial traumatism. That is the characteristic, diagnostic, "lucid period."

AUTHORS' ABSTRACTS.

Surgery, Gynecology, Obstetrics and Genito-Urinary Diseases.

New Technique for Operations on Steno's Duct. By Hugh Crouse, El Paso, Texas. Surgery, Gynecology and Obstetrics, May, 1915, pp. 593-596.

This article deals with a new technique for operations on Steno's duct. Technique: Make incision over the cheek 2 cm. below zygomatous process, 2cm. in front of the ear, thus avoiding arteries, nerves and veins passing over, through or underneath the parotid; the incision should be about 3 cm. in length, through skin and adipose tissue of cheek only; incise exposed fascia of parotid for about 1 cm. parallel to skin incision; grasp the lip, turn cheek out; mark off a pointed strip of buccal mucous membrane one-fourth inch wide and one-eighth inch deep, commencing slightly within the vermilion borderline of upper lip, stripping same back slightly posterior to or even with the cusp of the second upper molar tooth, leaving posterior end of strip thicker than anterior end and unseparated. Clip mucous strip with curved scissors, being careful to cut deep enough so that its vitality is not impaired. Tag strip with artery forceps. Pass Doyen or similar forcep through external cheek wound over surface of masseter to its anterior border; puncture buccinator, enter mouth just in front of the posterior area denuded; widely stretch forceps; catch mucous strip, draw into cheek wound, suture with No. 9 ten-day chromic gut, similar to Lembert intestinal suture; double tie, leaving ends long to fasten loop of No. 5 ten-day chromic gut, ends of latter remaining in mouth; subcuticular suture skin wound; whip denuded mucous membrane area together with small chromic gut. Nine illustrations demonstrate author's method and various other techniques.

Head Injuries. By C. G. Forsee, Louisville, Ky. The Railway Surgeon, April, 1915, pp. 606-612.

Forsee's paper deals principally with fractures of the cranium: (a) of the vault, and (b) of the base. The lesion may be simple, compound, depressed, punctured, etc. The majority of basal fractures originate in the vault, beginning where violence was received, and following the line of least resistance into the corresponding basal fossa, terminate or extend into adjacent fossae.

Some clinical features are: (a) Leakage through the fracture line into subcutaneous tissues of mucous cavities, including blood, cerebrospinal fluid, brain tissue; (b) injury to the large blood vessels; (c) injury to the nerves, and (d) infection, meningitis, etc.

The etiology, symptomatology, pathology and diagnosis of the various lesions are adequately outlined. The treatment is distinctly surgical, the prognosis should always be guarded.

The probable complications and sequlae are minutely described, and the dangers of intracranial hemorrhage especially emphasized. The importance of differential diagnosis between concussion and fracture receive adequate consideration.

The author concludes that the problems presented are frequently complex and sometimes difficult of explanation, but this should not discourage the surgeon from attempting logical diagnosis in every case. There is no part of the body in which the relationship between lesion and symptoms is more definite, and where accurate knowledge can be more successfully applied. The chief source of difficulty is severe head injuries cause multiple lesions of different intensity and importance. The gravest lesion does not necessarily produce the most obvious symptoms, so that accurate diagnosis and adequate treatment of one lesion may leave the patient in danger from some other unsuspected condition.

RAILWAY SURGERY

SKIN GRAFTING.*

By Jere L. Crook, A.M., M.D., F.A.C.S., Jackson, Tenn.

The practice of skin grafting, while usually regarded as a comparatively modern surgical feat, in reality was performed hundreds of years ago. In Leonard Freeman's little book on this subject he states that it was performed by the ancient Hindus two thousand years ago, and in support of this assertion he further relates:

It was the custom in India to punish certain offenses by cutting off the nose. As an almost necessary consequence, there appeared at an early date men skilled in plastic surgery, who belonged, strangely enough, to a low and despised class, the tile-makers' caste. Their work is said to have been excellent, even superior in some respects to that done at the present time. One of the most remarkable achievements of these pioneers in surgery was the replacement of the nose by a graft from the thick skin of the gluteal region, a feat which even now cannot be repeated with certainty. When we consider that the subcutaneous fat was included and that no support could have been had from underlying tissues, the success obtained seems little short of marvelous. . . .

It is probable that skin grafting, like some other arts, was largely lost sight of during the Middle Ages, although here and there a more or less authentic account of an isolated case has been preserved. For instance, it is related by Sancassani (1731 to 1738), that a female street vender, in order to prove the efficacy of a certain salve, was accustomed to cut a piece of skin from her leg, pass it around the audience upon a plate, and then replace it in its original position, covering it with salve. Such perfect union took place that the site of the operation was scarcely discernible.

About the end of the eighteenth century some account of the Indian methods of grafting was brought to Europe by travelers. The statements, however, were credited by few, and those who did believe were generally disappointed when they tried the experiment themselves. Nevertheless Van Helmont states that Tagliacozza, a Bologna surgeon famous for his achievements in rhinoplasty, constructed a nose for a patient in Brussels from the skin of the arm of a workman; but Tagliacozza has been credited with so many wonderful things that it is difficult to sift the true from the false. The skin from the back of a student's hand is said to have been used by Dzondi in the formation of a woman's nose, and Bunger succeeded in getting a portion of a graft from the thigh to adhere in a similar operation.

As early as 1836, Hoffacker, surgeon to a students' duelling corps in Heidelberg, succeeded in reuniting numerous severed portions of noses and a piece of a lip."

In recent medical literature we find similar cases reported. In Johns Hopkins Hospital Bulletin, October-November, 1892, Finney reports a case where a finger after being completely severed from the body seven hours became reunited. Another case where the soft parts of a nose grew in place after having been separated an hour is reported by Kelley in the *Times and Register*, Philadelphia, August 16, 1890.

Grafts have been defined as autodermic when from the patient's own body and isodermic, heterodermic or homo-dermic when taken from another individual. The terms autogenous and heterogeneous grafting are also used to describe the two sources of supply. As a rule the grafts thrive best when taken from the patient's own body. In my own experience I have undoubtedly secured the best results I have ever had when I secured the grafts from the patient himself, although in several cases when the patient's vitality was not so good, I have had most satisfactory results with the iso-dermic grafts, in two cases getting the skin from several individuals.

I have always been very careful to ascertain that the donors were in perfect health, as there is no doubt that diseases can be

*Read before the Southern States Association of Railway Surgeons, Auxiliary to Southern Medical Association, Dallas, Texas, November 8-11, 1915.

transmitted in this way. It often happens that the patient's general condition is so far below normal that it would be unwise to impose on him the nervous shock incident

to removing the skin from his own body. In such cases we are fortunate if we can find healthy donors in whom the spirit of altruism and brotherly love prevails to the extent necessary to cause them to shed their blood and cuticle for the afflicted one.

In these modern days, when greed and selfishness seem to predominate in the hearts of men, it is refreshing and uplifting to find men ready to make a blood sacrifice for one of their friends. It has been my privilege and experience in every case where I have asked for volunteers to find a ready response among white people. In one instance where I needed isodermic grafts to save the foot of an injured engineer, five of his friends (fellow employes) volunteered, and each gave all the skin I required, without fear and without reproach, and the foot was saved. No doubt many of you have seen such examples of unselfish, generous courage, and have felt, as I have, the moral uplift of such an experience.

As to the methods; those of Reverdin and Thiersch are the two principal ones used, Reverdin being the pioneer. His report to the Societe Imperiale de Chirugie, Dec. 8, 1869, first brought the subject prominently before the world, and was followed in 1872 by a more exhaustive paper in which he states that while he spoke of the small bits as "epidermic grafts," yet that title is not wholly correct, as he included a little of the dermis and the whole epidermis.

In a very interesting paper by Dr. J. S. Davis of Johns Hopkins (Journal A. M. A. September 19, 1914), he makes a very forceful plea for the "use of small, deep grafts" taken and applied according to Reverdin's suggestions, except that he takes more of the true skin than in the older method. His article is profusely illustrated and quite clear as to technique and treatment. I have read and studied it with interest, and yet I must confess he has failed to convince me of the superiority of his modified Reverdin method to that of the far more frequently used one of Thiersch with its modifications. The chief objections to his type of grafting are its tediousness, time required, its poor cosmetic result and the greater tendency to keloid formations. I cannot find a single

good reason for preferring it to that of Thiersch.

After describing the technique in detail, Freeman states: "In fact, the only excuse for using the Reverdin method is its comparative painlessness and insignificance as an operation."

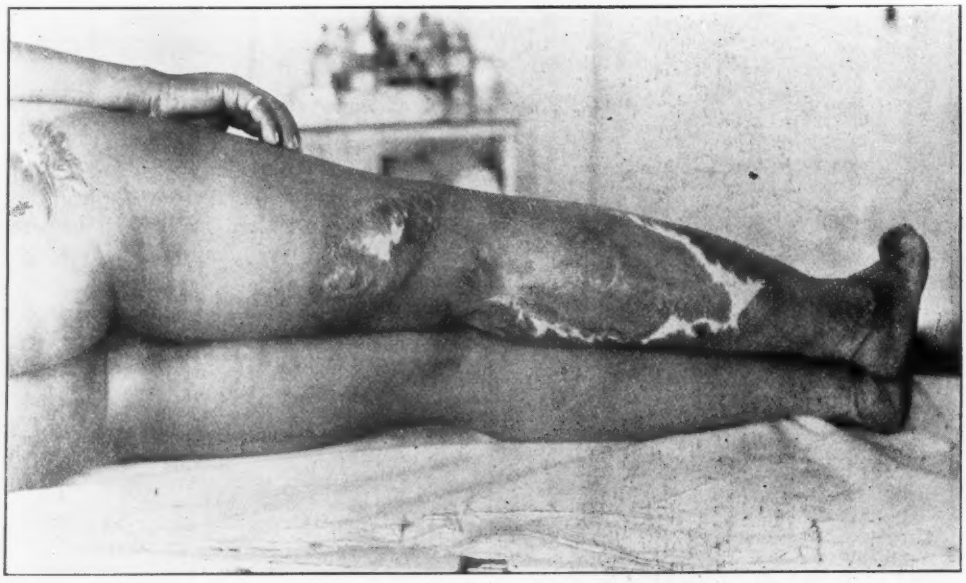
Where it is impracticable to secure a healthy granulating surface, the Reverdin grafts may be used with greater chance of success, but if one is willing to properly prepare his surface for grafting, and give proper attention to the technical details of the work, the method of Thiersch will yield far more brilliant results.

As to this procedure, Freeman remarks: "There is no process of skin grafting so simple, so reliable, and so generally applicable as the method of Thiersch, and yet it has never received the thorough recognition to which it is entitled."

Therefore, it seems proper to emphasize the value of this procedure on occasions such as this and to relate personal experiences to further stimulate interest in the subject.

In my own work I have never found it necessary to anesthetize my patient in order to scrape away exuberant granulations. A few days' treatment with antiseptic irrigations usually puts them in healthy condition. If they are sluggish and indolent, painting with iodine, followed by a 25 per cent solution of Balsam Peru in castor oil will furnish the necessary stimulus.

When ready for grafting the surface

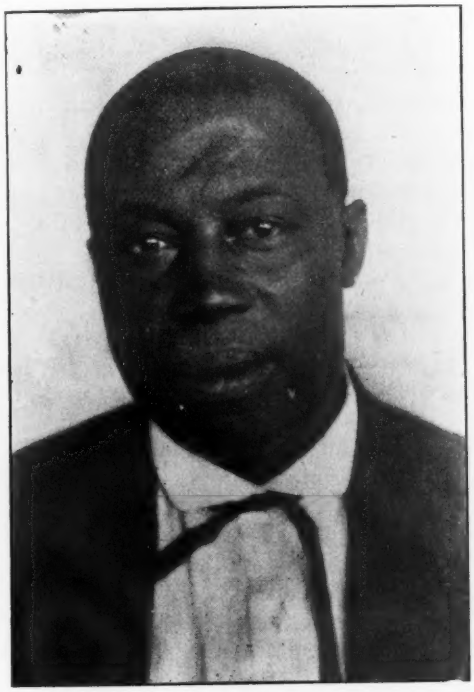


should be thoroughly irrigated with normal salt solution before placing the grafts.

The best place for obtaining the grafts is the anterior sufrace of the thigh, although I have frequently taken them from the arm when I did not wish very long grafts, also when several friends of the patient are giving skin it is quicker and easier to take it from their arms. When the skin is taken from the patient himself, I prefer the thigh. It is better to anesthetize the patient in this case. In fact, it is far better to get the skin from the patient himself if his general condition will admit of it. In this event no one is made to suffer, and larger

and better grafts can be removed when one is not hampered by the nervousness and suffering of the donor.

Some practice is necessary before one can remove the grafts deftly. An assistant should make the surface tense by placing his hands on both sides of the limb or pulling the skin down while the operator pulls it up, and with a very sharp razor cuts long strips. The



operator cuts towards himself with a side-to-side sawing motion, keeping skin and razor wet with salt solution. The razor should not emerge until a strip sufficiently long has been cut, as it is much easier to manipulate large grafts and requires less time. It is not necessary to cut through the entire thickness of skin, but if this is done, the value of the graft is not diminished, although the scar from its removal is longer in healing and more permanent.

The strips of skin will often curl up on the razor, but may be smoothed out in a basin of warm sterile salt solution, using a long-handled needle and small forceps. Afterwards I place them on oil silk wet with salt solution, and slide them from this on to the granulating surface. Some authorities advise overlapping each strip and the borders of the ulcer. If skin is very plentiful this may be done, but I have never found it necessary. If I use a long broad graft I perforate it to facilitate drainage and enhance its chances to live.

With Thiersch the removal of granulations was one of the principal features of his original method. He claimed that the more or less large and soft, superficial granulations, during their slow transformation into connective tissue, were the cause of cicatricial contraction, and that this contraction could be avoided by scraping away the granulations until firmer tissue was reached. He also thought that grafts grew better when this was done. This advice was universally followed until it was demonstrated by Schnitzler and Ewald that it is unnecessary to remove healthy granulations and that grafting can be done directly upon their unaltered surfaces with the production of a movable skin, and without appreciable subsequent contraction.

Instead of scraping with a curette, Sick simply rubs away the granulations with a bunch of gauze, or a stiff nail brush may be used. Halsted, McBurney and others prefer to shave the surface with a scalpel or an amputating knife, claiming that a smoother surface is obtained devoid of partially separated and bruised portions of tissue, which tend to become necrotic and interfere with the vitality of the transplanted skin.

As stated previously, I have not found it necessary to curet or shave off the granulations. I prefer a moist dressing of normal salt solution on gauze, with strips of perforated oiled silk, which is kept in warm saline solution until ready for use. Numerous methods of dressing are in use, including

dry dressing, the open method with a wire cage, sterilized olive oil, boric acid solution, splinting the grafts with wide meshed curtain netting soaked in gutta percha and chloroform, silk netting treated with parafine, etc.

Bernhard advocates exposure of the newly grafted area for a short time to the direct rays of the sun, while Schepelmann douches the new skin for several weeks with hot air, by means of a special electric instrument, claiming that better and more permanent results are thus obtained. Thies covers the grafts with a thick layer of fine sand, which has been sterilized by boiling in a 1 per cent solution of sodium carbonate and then dried. He considers that this method has a number of advantages, among which are the removal of fluids by capillary suction, the splinting of the grafts and the prevention of coagulation of the discharges by the alkalinity of the material. The sand should be changed frequently.

I have found the dressings I have used entirely satisfactory and have therefore tried none of these others. I usually remove the dressing in from five to seven days. The pictures illustrating are of the two most seriously burned patients I have ever successfully treated. In both recovery was due to skin grafting. Not only restoration to health, but also prevention of deformity and distressing disability was accomplished by grafting. Both patients, together with five others, were burned and scalded in a boiler explosion at the Bemis Cotton Mills near Jackson, and all were brought to our sanatorium for treatment. The white patient was burned almost beyond recognition. His face, head, neck, ears, hands, arms, legs and entire back were burned to the second and third degree. The photo shows that the ears were partly burned off, but gives no adequate picture of the depth and extent of surface involved. It does show the fine, smooth appearance of the back and legs, however, and this cosmetic and functional result is due to Thiersch grafts (in this case of hetrogeneous origin), the donors being his brother and a friend and a recently circumcised baby, whose foreskin played an important part in covering an extensive raw, ugly granulating area on one leg. The patient's vitality was very low, and at times he ran a high temperature, but finally after a very tedious convalescence he was restored to perfect health with no functional disability of limbs or body.

The negro whose photos are shown, suffered a compound fracture of the skull, necessitating trephining and removal of fragments of bone from the brain. In addition he was burned extensively and deeply on face, head, back, side, arm, thigh and legs. The burn on calf of leg was of the third degree, extending from ankle to three inches above the knee. The muscles partially sloughed away, almost exposing the vessels in the popiteal space.

To secure donors of skin for him was impossible. When the request was made of his wife, she was horrified, and exclaimed, "Who, me, let you cut off my skin for him? Naw, sir, I didn't promise to do dat when I married him." Fearing that I would insist, she left the hospital and eventually deserted the patient and has nevermore returned to his bed and board. The spirit of altruism has not yet permeated the colored race to the extent necessary to cause them to shed blood for each other.

Therefore, the patient was anesthetized and the required amount of skin in long, broad strips was removed from the opposite thigh and successfully grafted on leg and side and axilla, preventing contraction that would have seriously crippled the patient, and hastening and insuring his complete recovery.

DISCUSSION.

Dr. R. W. Knox, Houston, Texas.—I am in the habit of anesthetizing the patient to do skin grafting, especially on large surfaces. I think it well to do this on account of pain that is produced in getting rid of the exuberant granulation.. A good soap and water scrubbing is also important

in getting rid of pus. In the lower limbs spinal anesthesia can be used to good advantage. The technique adopted is as follows: Transfer the grafts directly from the razor to the wound surface; any other method is tedious and difficult. If the grafts are transferred to a salt solution they have a tendency to curl up, and in this condition they are very difficult to apply. As a dressing for the grafts I now use exclusively narrow strips of oxide of zinc plaster which comes in sterile packages. These strips are put across the wound in a basket like way, and on this is applied a dressing consisting of gauze slightly moistened with sterile salt solution. The secretions that may form are taken up by this and the gauze can be changed without disturbing the grafts. The zinc plaster can be removed in four or five days, at which time the grafts will have thoroughly taken and moist applications for a few days longer will complete the work. This method has been exceedingly successful in my hands.

Dr. Denegre Martin, New Orleans, La.—The doctor's teaching is this: That we have in these cases a superficial or granulating layer and a deep horizontal layer, and it is in the horizontal layer that we get the blood supply to the skin, so that if we cut through the chorion then replacing the skin from the vascular surface we get an ideal condition. I have been doing this ever since it was taught at first—probably three or four hundred, and rarely one fails.

Another thing: If you put these grafts on top of the granulating surface before the maximum amount of contraction has taken place, the contraction will go on. The way to do that is to watch. Nature is making an effort to cure that ulcer. You see the blue margin of the granulating surface, then you realize it is the best time to do that grafting.

The Riverdin method is a graft put on the granulating surface, and is a very different condition altogether.

The latest thing is the suggestion of Davis. I find it is the easiest thing to apply, and our results are excellent. It does away with all of the old methods. We found if we could use the gauze it would absorb the pus, etc., and the gauze just simply covered over, and it does very well.

The dressing of that graft is the most important of the whole thing, and the doctor has brought out another thing. Just take it right off. Dressing of the graft is more important, because, unless you fix your dressing, you will find in a week or ten days the graft is all bunched up. I put on the dressing at first, hold that with adhesive strips, and that with a wad of cotton, because that causes not enough pressure to interfere with the circulation of the graft itself.

Dr. F. L. Watson, Oklahoma City, Okla.—I think Dr. Crook's paper is indeed a very important one, and his mentioning skin grafting in connection with burns should call to our minds that we should use it very much more frequently in burns that we do. I realize that in the colored race we sometimes encounter the difficulties that the doctor mentioned, but I am surprised that it should have occurred to a gentleman from the South. I think the doctor's trouble lay in the fact that his explanation to the lady was made too plain. Had he used more polysyllables that were unintelligible even to himself, then he could have secured the skin.

We all know, in following a burn, as the slough occurs and granulation begins, a local leukocytosis, so to speak, takes place, and that the site of the burn is cofferdammed against infection. Those of us who have lived in the mining district where we have extensive burns have noticed that we have few infections. We have our first rise of temperature then the local areas learned to take care of themselves, and it does not matter so much what technique you use. We cleanse the skin, in using the autogenous graft, and even scrape the skin as if you were going to implant a vaccination, and distribute the scrapings around the granulating surface. They will adhere because the rich blood supply that exists that nature has thrown up there and is only anxious to protect any skin graft which may be applied by whatsoever technique.

Dr. Wm. M. Perkins, New Orleans, La.—I arise just to say a word for the under dog—the Riverdin graft. First, I wish to congratulate Dr. Crook upon such masterly grafting as brought a man a new foot and a new wife and thirty additional pounds of flesh.

Out here is a Greek colony, and a short time ago they had a horned rooster out there "imported from Greece." Shortly afterwards another appeared, "imported at great expense." They sold settings of eggs sired by those roosters at $4 per setting. It was found afterwards they had been grafting spurs on the heads of young roosters! Those Greeks as successful grafters surprise even Dr. Crook, as the results of their work are growing indefinitely.

The doctor says the ladies take up the new fashions—and perhaps each lady prefers her own style of hat. I guess each one prefers his own graft technic. My pet technic for dressing grafts on limbs is to take two or three layers of gauze, much larger than the area to be covered, and wrap them thoroughly around the limb and let all the drainage occur through it. If it becomes ncessary to drain through a graft, the gauze may be clipped. The gauze being wrapped firmly and smoothly around the limb, any amount of dressing can be applied to suit your taste. Slightly moistened gauze fits snugly and soon dries. If one puts it on carelessly it slips and tears off the grafts. I believe that the oiled silk and rubber dressing are more or less bad, especially in warm weather.

Dr. W. W. Crawford, Hattiesburg, Miss.—Without wishing to prolong the discussion, I desire to relate very briefly a case of skin grafting that came under my observation a year ago, with this history: A woman of about thirty-five years of age, weighing about 190 pounds, had, eleven years ago, a case of puerperal sepsis following the birth of her first child. This sepsis was the complication of a very bad laceration. The end result of the puerperal fever was that all the mucosa of both vagina and endometrium were destroyed. The granulations incident to repair completely filled the uterus and vagina. There was nothing but the urethra to show the original location of the vagina. The patient, of course, did not menstruate for a period of eleven years. We undertook to correct the deformity for her.

We thought perhaps we might restore the vagina and at least make her more comfortable, because she was suffering a great deal with bladder trouble, due to the fact that the bladder had fallen into original space occupied by vagina. We tunneled out the original location of the vagina, hoping, as we got into it further that we could find at least some remnant of mucosa left. It was necessary to dissect the bladder and lift it up. We found the location of the cervix. Grasping it we tunneled out what we thought was probably the original canal. We packed that and took two large flaps from the thigh, turning them in and making a new vagina. The skin grew, and it was only necessary to do a little additional skin grafting. As a result of this operation the woman has a restoration of the vagina, and, what is much more interesting to us, she menstruates each month painlessly. As I said, this operation was done about the first of December last year, and but for the integrity of the skin graft, it would not have been possible.

Dr. A. C. Scott, Temple, Texas—Gentlemen, I do not wish to prolong this discussion, but it is an interesting one to me. I have enjoyed the paper very much, and feel that it is a little bit like some of the styles spoken of this afternoon. We are inclined to follow the styles, whether they are practical or not.

I think in skin graft we should bear in mind those things which cause failure of skin grafting to grow. It does not matter how much you put on some of these grafts, some of them are going to grow. At one time my associate and myself had quite a dispute as to whether these grafts should be very thin or very thick, and one day we were working on a space where we had to cover 4x10 inches in size, and he planted his grafts on one end and I planted mine on the other, and his were all thick and mine were all thin. I was certain his would die out and he was as certain mine would. Neither died out, so that satisfied us as to whether they should be thick or thin.

Most surgeons will recognize the fact that grafts do not grow well upon surfaces that are very septic. We know, also, where grafts are placed upon very fresh wounds, where they are still bleeding all over, that they may not grow so well. We know on fresh surfaces where we dress the wound and allow it to remain long enough for the oozing to cease, thin grafts placed upon the surface nearly all grow without much trouble. In considering the subject we know that profuse discharges are detrimental to the growth, and when 1½ by 2 or 3 inches long are placed on, when the secretions increase underneath they do not lie in close contact with the capillary vessels beneath, and if they do not lie in close contact, they fail to get the proper nourishment and fail to take hold, so to speak, and are very much more apt to be lost.

The writer of the paper spoke of perforating the graft. I was glad to hear him mention that, because I have been very much interested in that phase of skin grafting for a number of years. I think it was four or five years ago when I presented a paper at Hot Springs, Va., upon this subject, in which I gave quite a lot of the details which we have been using for several years, and the main thing we laid stress upon was the necessity of perforating these large grafts in order to keep the secretions from balooning them up.

We find we can handle these grafts best by spreading them out on rubber tissue with the raw side up, than by using the rubber tissue, if it is wet; the skin surface is placed down on the rubber tissue, they will stick very closely, and we can perforate them easily, cut them into the sizes and shapes of the wounds we have to fit. We can make them triangular or almost any shape we wish, in order to fit the tissues being covered.

There is just one thing that must be taken into consideration in placing skin grafts: There was a point mentioned by Dr. Martin, they must not be allowed to slide. I think Dr. Knox spoke of holding them down with adhesive plaster. It does not matter much how you hold them down, so you hold them long enough to get a good hold and train them, and many grafts which have taken hold pretty well may be peeled off if the dressing has been allowed to become filled with dry secretion then peeled off roughly, without consideration for the delicate tissues to which they are attached.

After we have perforated the rubber tissue, cover in about the wound, place the raw side down, leaving the rubber tissue which has been perforated when the graft is right in contact with it, then any substance you want to put on there is all right, I think—the gauze, etc.

Dr. Crook (closes)—There are distinguished and efficient "grafters" among the membership of this Association. This paper was originally written to be read in Virginia, but on account of the illness of my little boy, I did not get to read it there, and so brought it down here. I did not try to teach the Texans anything new about "grafting."

I had not thought of getting the sterile strips of adhesive plaster. I had always looked upon this as being unsterile, but the doctor says it comes prepared for that purpose. It is absolutely necessary to hold the grafts in position; and then you must provide for drainage by perforating the oil silk, and in large grafts perforating the grafts. I think the plan of cutting both at the same time a very good suggestion.

I would be a little slow to use the vaseline, as suggested by Dr. Martin, because I believe the vaseline would have a tendency to cause the graft to curl up or slip off, but if the doctor has had favorable experience with it I am sure it is a good thing.

In large hospitals, especially large emergency hospitals, where one has a case that requires a great deal of skin, one can nurse that along for a few days, when probably he will have an amputation, and from this freshly amputated leg or arm can take all the skin he wants for grafting. This is done in large hospitals, where they have all sorts of cases on hand at the same time.

EYE, EAR, NOSE AND THROAT

OCULAR MANIFESTATION OF FIFTH NERVE IRRITATIONS.*

By Edward H. Cary, M.D., F.A.C.S.,
Dallas, Texas.

The fifth nerve, its distribution and its possibilities have been treated seriously by a great many essayists the last few years, and a great many ocular disturbances which were not well understood have been approached and relieved through measures directed toward the relief of sensitive areas of this nerve that have become disturbed and that have brought about a symptomatology difficult to understand. The branches of the fifth nerve which are distributed to the nasal membrane covering the upper part of the septum, the middle turbinal bone, the ethmoidal cells, the frontal and sphenoidal sinuses are the branches which largely bring about intra-ocular and extra-ocular irritations that attract the best thought of the men who do opthalmological and rhinological work; and if there were nothing else to prevent a man limiting himself entirely to the practice of opthalmology, the peculiar inflammation of the eye so often traceable to nasal conditions would in itself make of every opthalmologist a persistent rhinologist.

Peculiar cases of uveitis heretofore consistently diagnosed as of specific origin quickly disappear with appropriate rhinological work. So-called hyalitis with marked transudates throughout the vitreous disappear with correct measures applied to the offending branch of the fifth nerve, which is either pressed upon or chronically inflamed. Vaso-motor disturbances with corneal errosions, marginal or in the cornea alone, rapidly heal when irritated areas in the nose are dealt with. In some cases intra-ocular tension, not accounted for in any other way, is rapidly reduced with the resumption of normal vascular aspect when the nasal distress is relieved; and in one case of retinal detachment, the absorption of the fluid back of the retina, where tension of the eyeball was reduced, was extensively absorbed following corrective measures directed to the branches of the fifth nerve terminating in the adjacent sinuses and membranes of the nose. So we might go on to recite numerous instances of ocular distress traceable to the irritation of the fifth nerve and quickly modified when the terminal filaments of this nerve have been relieved. I may go far enough to definitely declare that the symptomatology is as variable as the particular pathology which may involve certain localities in the distribution of this nerve. From my observation I am led to believe that the pathology which brings about these ocular distresses can be classified as irritations due to pressure and constant disturbances, such as malformations, i. e., ridges upon the septum, etc. In the same way cystic middle turbinals, inflamed ethmoidals, particularly where there is no discharge or active process of any kind, in contra-distinction to infected sinuses where there is pus. The latter is not the direct cause of the ocular manifestations mentioned. This condition is hard to explain and cannot be understood without a clear conception of the influence the sympathetic nerve system exerts, as a control or accelerator of the nervous impulses which originate somewhere, and are distributed elsewhere in a manner justifying the expression of "reflex disturbances." For instance, the inhibition of the nervous impulses to the vascular coat which we classify as the vaso-motor nerves, controls the blood supply and re-

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sponds to known stimuli in a manner which is probably understood, i. e., as in hay fever. So it comes about that we have a reflex frequently occurring from an irritation, the location of which we have to seek, and when found the value is brought forcibly to our attention, particularly so when we learn to discriminate as to cause, and seek to differentiate between the peculiar appearance of these vascular disturbances.

It is claimed the most general and best understood function of the sympathetic nerve is its vaso-motor action, and it is related that many observations have been made of the unilateral flushing of the face and neck which might be attended with noticeable hyperemia of the conjunctiva and narrowing of the palpebral opening. Jackson, in a book compiled by Posey & Spiller, notes that he has seen hyperemia of one eye, especially of the conjunctiva with narrowed openings and slight tonic ptosis, following influenza, and remarks that cases of this kind have not received the attention they deserve. He also notes that pulsating exopthalmos, when not due to gross lesions of the orbital vessels, may be regarded as vaso-motor disorder.

Parsons and Snowball claim that increase of the intra-ocular tension caused by stimulation of the peripheral portion of the cervical sympathetic is not due to vaso-motor action but the contraction of the unstriped muscle of the orbit. The principal extra-ocular muscles of this character are those acting upon the lower or upper lids, and the fibres stretched across the sphenoidal and sphenoidal maxillary fissures, but there is general doubt cast upon the subject by the statement that its action is more likely apparent than real, the appearance being produced by widening and narrowing of the palpebral opening.

Weeks, claims regarding glaucoma that the testimony in our possession is not sufficiently conclusive to enable us to say there is any constant change in the cervical sympthetic peculiar to glaucoma nor is it sufficiently conclusive to exclude the possibility of such change.

Statistics from Wilder indicate that the simple form is the one most suited for it, next to the hemorraghic if that can be determined. Excision of the ciliary ganglion practiced by Rohmer has not been as efficient as excision of the superior cervical ganglion for the reduction of intra-ocular tension. The foregoing observations are based in a general way upon the influence of the superior cervical sympathetic and is only mentioned here to show that consideration has been given that phase of the subject. Dealing more directly with the anatomy: The sympathetic nerve supply to the eye and its appendages comes through the superior ganglion, which Mr. Langley calls a "relay station" of the sympathetic nerve supply for the head. From this ganglion branches form plexuses which accompany all the arteries distributed to the orbit and surrounding region, as well as the other branches, mostly from the larger plexuses; the third receives such a branch at its point of division; the fourth as it lies in the walls of the cavernous sinus and from this plexus a direct branch to the ciliary ganglion; the fifth in the Caesarian ganglion; the sixth where it lies in close apposition with the carotid plexus, and the seventh at the stylomastoid foramen. In the orbit is situated the ciliary ganglion—this is about two millimeters long and one millimeter thick, and lies slightly to the temporal side, slightly lower than the optic nerve, eight to eleven millimeters from the foramen and fourteen to seventeen millimeters from the entrance of the optic nerve through the sclera. Its roots are distributed from the fifth nerve usually from the branch of the nasal just after entering the orbit. A filiament of the carotid plexus and filiament from the oculamotor, usually from the branch supplying the inferior oblique, give off the short ciliary nerves which enter the posterior part of the

sclera and run forward between it and the carotid to the ciliary muscle and iris. Thus we have the sympathetic reaching all parts of the eye and its appendages, its special mechanism supplying the iris and ciliary body. The whole question, it seems to me, is understood anatomically but has been studied from the relative effect of the irritations of the ganglia in lower animals, conclusions being drawn from the results obtained by stimulating the ganglion, whereas, the study of the pathological changes in the distribution of the fifth nerve and its influence in remote parts has its limitations and necessarily has not been sufficient to bring about any definite opinion. As a clinician, I have drawn my conclusions in spite of such limitations, disregarding the effect the ganglion has when irritated, my thought being centered upon what influence an irritated nerve which must pass through the ciliary ganglion is likely to have upon the other fibres distributed from this ganglion. Right here permit me to say that I feel we should direct our attention to the further study of the latter phase of the subject without regard to any conclusions which may have been drawn from a study of lesions of the cervical ganglion. I think it is possible for zones of irritation within a given area of the nose to so disturb the ciliary ganglion that the sympathetic nerve distributed through the ciliary ganglion will lose control of its function over the vascular part of the eye where the fifth nerve and sympathetic control and through the simplest irritation we may have this disturbed function manifested. In the ciliary branches distributed to the vesels running to the outer coats of the eye we have manifestations easily seen and of diagnostic value; whereas, the ciliary branches that are distributed to the intra-ocular part of the eye are not easily observed and, as there are branches to nearly all parts of the eye, you can readily follow this thought and understand why the various coats or a single coat of the eye can be disturbed without it readily coming under observation. This depends upon the point irritated and from whence the impulses come and their influence upon the ganglion. The sympathetic can in itself become so involved that it may excite or suppress all impulses. These distresses may reach the point of disturbed nutrition with corresponding damage, requiring time to repair, or it may be simply functional disturbances easily remedied as soon as any acute nasal irritation is corrected—such as an acute cold. Intra-ocular pressure may not be disturbed perceptibly, yet you can have intra-ocular pressure disturbed through prolonged vascular distress increasing the pressure, giving us certain types of uveitis repeatedly occurring, finally leading to secondary glaucoma due to this intra-ocular pressure. On the other hand, you may have a marked disturbance in the function of the ciliary gangloin following repeated occurrences of the vascular distress, bringing about a suppression of all impulses of vascular control and the intra-ocular tension may fall from mere lack of function of the ciliary processes and ciliary body which secretes the fluid that sustains the intra-ocular pressure, and in this way lead to isolated cases of detached retina.

Before concluding, I wish to say that I have observed a few cases of vernal catarrh. Most of the cases I have seen occurred in old trachoma lids where there has been additional membrane to become highly irritated and inflamed. Conditions coincident to the development of nodular masses on the conjunctiva were controlled by destroying areas where the impulses were generated. These areas are in the nasal membrane which are boggy and in contact with the turbinal. The nodular masses in the conjunctiva and corneal invasions rapidly subside and vision is restored; whereas, the treatment of the eye itself would be of no consequence. I have seen several cases of conjunctival distress simulating both trachoma and vernal

catarrh rapidly subside from nasal care. The impulses apparently stimulating the ciliary ganglion have brought about trophic disturbances which simulate these diseases. Who has not seen certain types of conjunctival distress with photophobia in children, simulating trachoma, and not relieved with the usual treatment for trachoma, rapidly cured after the removal of adenoids tissue, the secretions from which irritated the nasal membrane sufficiently to disturb the fifth nerve distribution. Removing the cause, the nasal membrane promptly improves along with the symptoms.

The histological explanation of the foregoing can be based upon the fact that in the substantia propria is found lymphatic tissue and sometimes true lymph nodes. In some diseases there are unusual marked productions of these lymph nodes which are associated with epithelial crypts, which led Henle to regard them as of gland formation. Small glands with structure similar to that of the lachrymal gland are also present in the palpebral conjunctiva along with the lachrymal gland, and are found in the upper lid at the outer angle of the fornix. A similar gland also occurs at the mesial angle. The lymph nodes above referred to occur in or near the fornix.

The nerves distributed to these glands are the fifth and sympathetic. The nerve filiaments end as end bulbs in the conjunctiva in simple endings about the epithelial cells, the sympathetic nerve supply, the tarsal and other lid glands and blood vessels. The sympathetic fibres end in a simple manner in the gland cells, each and every cell having a filiament of this nerve distributed to it, and any irritation at a distance can reflexly involve and disturb the metabolism of a group of cells bringing about nodular masses which disappear with the removal of the cause. Whether it is a result of a toxemia or a disturbed metabolism or nerve filament distributed in the nose, bringing about any unusual energy which might be expressed in unusual impulses, finally destructive in themselves, is a question yet to be settled. Many men writing upon this subject consider it an infection, and that this infection is the cause of all the changes which have been described. For my part, the conditions I have touched upon in this paper are not associated with pus or pus formation, and inasmuch as many change rapidly and completely in such short time when the areas are destroyed that produce the trouble, I cannot help but exclude the question of infection and believe it to be a condition associated, as intimated, with distorted impulses or waves of energy unusual and finally destructive of remote parts, due to the influence of sympathetic nerve disturbance which governs, in a manner, the nutrition of the parts involved. I am willing to grant that toxemia based upon absorption of toxins might be the stimuli producing these impulses, and between these two views the field is ripe for further investigation.

So we might elaborate as to the fifth nerve and its many idiosyncrasies. The key, as I understand it, is the recognition of the peculiar appearance of the vascular distress of the eye and the changes which involve the conjunctiva and cornea, the observation of which will lead you to seek the particular places which might be the seat of the trouble. I could relate specifically, cases of extreme interest, involving, as I have indicated, all parts of the eye, the pathology of which was understood from its appearance to be the result of certain fifth nerve disturbances. Cases that a diagnostician can differentiate and at the same time not allow himself to be misled with the belief that all ocular troubles are the result of nasal irritation.

DISCUSSION.

Dr. T. W. Crowder, Sherman, Texas—I feel that this is too important a paper for us to let the discussion lag. As Dr. Cary mentions in his paper, the tendency now is to consider all of these manifestations of a toxic origin, but we

see so many cases without any pus formation in which we have these same manifestations. This paper deals with the ocular manifestations of fifth nerve irritation, and now we find it just as true in the reverse of this subject, that is to say, manifestations in the remote distribution of the fifth nerve of ocular origin. I now have in mind a case which emphasizes this point. The patient was a doctor's son, who was brought to me suffering intensely with headaches and complaining of marked obstruction in his nose, simulating hay fever very much, with the exception that the symptoms were much more exaggerated during the winter while the boy was in school than during his summer vacation. Upon examination of eyes I found a decided hypermetropic astygmatism, which I corrected with glasses, and gave absolutely no treatment for nose. In less than ten days after he began wearing his glasses he reported to me that his headaches were entirely relieved and the trouble in his nose had completely disappeared. If we would investigate more closely for points of irritation in the distribution of the fifth nerve, I am sure we would be very much aided in the handling of some of our stubborn eye, ear, nose and throat conditions.

THE METHOD AND VALUE OF A BLOOD-CLOT IN A MASTOID OPERATION.*

By Frank D. Boyd, M.D., F.A.C.S.,
Professor of Oto-Laryngology, Texas Christian University,
Ft. Worth, Texas.

The use of "Blood-Clot" to promote early filling of the so-called dead space of the mastoid wound, and incidentally to obtain primary healing of the outer wound, has added an interesting and instructive chapter to our knowledge of mastoid surgery.

Since the bone operation does not differ from that in which the open method of after treatment is used, the whole procedure may be described in rather a brief manner.

THE PREPARATION OF THE PATIENT.

The operative field is exactly as described for the old method; the drum membrane, though showing a fairly large perforation, should be reincised in order to provide the freest possible drainage from the tympanum. The post-auricular incision through the soft parts differs from that used in the old operation. It should be made a little farther behind the post-auricular attachment; it should commence at the tip and be carried upward, following a curved linear direction, parallel with and one-half inch behind the attachment of the auricle. Especial care should be taken not to injure the periosteum. Unless it be absolutely called for, the supplementary horizontal or "T" incision should be omitted, and the primary incision should be made one-fourth inch farther back from the auricular attachment. This additional space is available for the bone operation.

When the bone operation is completed, the cavity is washed out with a normal salt solution, dried, and then allowed to fill with blood. The anterior and posterior flaps are then brought together, the edges carefully approximated, and held together by Mechelle's skin clipps (this, however, is a matter of preference, as some might prefer interrupted sutures of cat or silkworm gut). In this way the wound is entirely closed except at the lower end, which is left open; the lower portion should be left free for serous out flow. Over this a large protective dressing of sterile gauze is applied.

The post-operative treatment consists chiefly of daily changes of the protective dressing. One should be very careful not to infect these wounds. At the same time a wound treated in this way is not half so liable to become infected. The clipps are removed on the fourth day, and this, in my judgment, has a great advantage over the sutures, as you have to leave the sutures from five to seven days. In favorable cases the wound so far as future care is required, has every appearance of and is healed in from four to eight days.

The facts which its advocates urge in favor of the adoption of this operation may be stated as follows:

First.—The blood-clot itself has been

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proved to possess a decided bactericidal property, and this is depended upon to counteract any germs left in the wound, and to prevent any infection.

Second.—In surgical diseases and injuries of the long bones, the use of the blood-clot has provided a reticulum or scaffolding upon which new tissues have seized; the clot then becomes quickly organized and finally converted into permanent osseous tissue. The cavity resulting from mastoid operation is regarded as providing a favorable field for this conservative process.

Third.—In actual experience a large proportion of cases operated upon by this method have been successful in our hands.

Fourth.—The blood-clot operation saves much pain and discomfort, and in the case of wage-earners, the loss of time from work is only a small fraction as compared with the post-operative period of the old method.

As to the danger of the closed wound in case infection should occur, the remaining focus of infection would involve the blood clot itself, sooner, than normal living tissue. The natural tendency when a sufficient amount of septic material has been left in the wound to interfere with natural healing is toward destruction of the clot, consequently breaking down of the wound margins. Hence, the dangers to life are purely hypothetical.

Should the blood-clot break down during the period of its protective viability, it results in the formation of foundation granulations, act as a basis for subsequent repair, with speedier and more satisfactory healing of the wound.

The blood-clot method has its disadvantages as well as its advantages, in that the vault, should it become infected, would have to be drained backward through the aditus into the space formerly constituting the antrum. In blood-clot operations we are deprived of the use of the aditus as a means of draining the vault.

Bacteria and their virulency in a mastoid are always an unknown quantity, varying in each case, therefore it is essential to completely exenterate all the cells of the mastoid before the blood-clot is attempted, for fear that there are some hidden bacteria that might overcome the resistance of the tissue, in which instance the blood-clot offers the best culture media for a prolific growth. When a mastoid comes to a secondary operation, the operator usually finds some infected cells, which were not removed at the original operation. (The zygomatic cells and behind the lateral sinus are the most likely to be overlooked.) I am persuaded no one will accuse us of recklessness or disregard for operative results after reading the reference to more than twenty-five cases of blood-clot mastoid. Among this number we report the following cases:

(1) A. B. F., female, age 4, had la grippe some three or four months previous to operation. Three weeks prior to operation, she complained of acute pains in right ear, followed by rise in temperature. Three days later had bloody discharge from her ear. She came to our office on March 3, 1914. Upon examination, we found she had a marked swelling and tenderness over mastoid region, with temperature of 102 degrees. We advised an immediate operation, and she was sent to the hospital and operated on that same afternoon. After the routine preparation was made, we made our incision well back into the edge of the hair, so as to obviate the ugly scar which sometimes results from the mastoid operation. We found the pus had buried the periosteum, which necessitated our doing the regular mastoid operation. The wound was allowed to fill with blood and the edges approximated as before described. A catgut drainage was placed in the lower extremity of the wound to permit the escape of the serum. This also prevents post-operative swelling. Twenty-four hours later the patient's temperature was normal and at the end of the fourth day, she was removed from the hospital to her home. On the sixth day she was brought to the office and on the seventh day discharged without the evidence of a scar, except a hair line mark, which is obvious on very close inspection.

(2) and (3) O. P., female, age 8, and M. C. P., male, age 3, brother and sister. Had scarlet fever, followed by severe pains in ear at the be-

ginning of the second week. A myringodectomy was done by the family physician, followed by a profuse discharge from the ear. This continued for three or four weeks and then dried up. Swelling and tenderness was noticed over the mastoid region, followed by pain and rise of temperature. These patients were referred to us by the family physician for an examination. We recommended that a mastoid be done. These patients were sent to the hospital and prepared for operation, and operated on the following morning. On opening the mastoid, the cavity was completely filled with pus. Nature had largely done the operation, by destroying the mastoid cells. After thoroughly cleansing the wound we decided to take changes on a blood-clot. The mastoid cavity was filled with blood and closed as before. It was dressed the first time on the morning of the third day. On the fourth day the skin clipps were removed and patients were taken to a private boarding house. They came to the office each day for dressing, for three days, then dismissed, and were taken home more than one hundred miles away. Made a complete and uneventful recovery.

(4) Jno. W., age 6, male; double mastoid, following a case of ambulatory la grippe. He came to our office complaining of severe pains in both ears; upon examination we found the drum membrane badly inflamed and bulging, with tenderness and swelling over both mastoids; temperature was 103 degrees, and patient very restless. We advised a double mastoid with blood-clot. Patient was carried to the hospital and operated on the same evening. The old form of operation was done. Upon opening the mastoid, we found the cells filled with bloody pus. The blood-clot method was carried out as before described. Twenty-four hours later, temperature was practically normal, the child was resting well. On the third day, dressing was changed. Fourth day skin clipps were removed, and the child was taken home. On the fifth day and sixth, patient was brought to the office for dressing, and the seventh day was dismissed. Made a complete and uneventful recovery.

(5) H. C., age 3½ years, male. He came to our office on January 1, 1914, with an incomplete mastoid history. Gave history of having repeated risings in right ear, followed by rise in temperature and ear ache. This condition had continued over a period of six weeks, and child had lost considerable weight, and complained of a tenderness over mastoid region, but no swelling. After thorough examination, we advised a mastoid operation, although there was no bulging of drum membrane which seemed to be completely closed, notwithstanding repeated abscesses, as above described. Upon opening the mastoid we found tip cells to be completely filled with a thick creamy pus. A complete mastoid operation was done, the cavity thoroughly cleansed with saline solution, then filled with blood-clot. The wound was closed as above described. On the fourth day, skin clipps were removed, and the patient taken home; on the eighth day he was dismissed from office as cured. Practically no signs of the operation were left except a hair line scar well back in the edge of the hair.

DISCUSSION.

Dr. L. Haynes Buxton, Oklahoma City, Okla.—This method of procedure in dressing following simple mastoid operations has been reported to the profession by operators for several years, but today after listening to the interesting and very favorable reports of Dr. Boyd, and such clear reports of the cases that the essayist has given, I am sure that we must admit that this method of dressing is worthy of a more extensive use. The element of *time* in these younger, and older cases as well, is worth considering. The rapidity of placing these patients outside of the hospital at so early a date makes the use of this method of dressing in more of our cases desirable. The doctor does not infer that this method applies at all to extensive or radical operations, but only to simple mastoid operations. If we can discharge our patients in four or five days, it is a very much superior method to the old method of packing that has been a routine practice by many for years. Not only this, but the method obviates the painful afterdressing with packs, which in nervous children is so distressing. We should always seek for those methods that will give the most rapid results with the least hospital expense and annoyance to our patients. Even if a failure of union result in a few cases and a redressing be necessary, it does not overbalance the very excellent results in the majority of cases.

Dr. Arthur Irving Weil, New Orleans, La.—I am very glad to hear the good results reported by the essayist, in a way, and in a way I am not, because I am not convinced that theoretically the blood clot operation has appealed to me always. Of course, it does not require very much argument to convince us that if we can take an operation in which the after treatment ordinarily requires six or eight weeks, which is the ordinary time which the mastoid runs, and get the same result in one or two weeks, the advantages are tremendous. That appealed to me, and I have tried, I don't know in how many cases, I have tried this blood clot method of healing, and I have yet to have a successful case.

Now, I imagine that the reason for that is that my methods must have been faulty in some way, although I followed the directions as given in the literature. I am going to try again, but in the last year I have had some unpleasant experiences with the blood-clot method. In two cases I had a very unpleasant complication, that is, on the second day the patient complained of

pain in the neck, and the pus penetrated down along the sterno mastoid muscle, so that it became necessary to make an incision down in the neck to drain out the pus through this counter opening. In the ordinary open method I don't think this complication would have occurred. Consequently, I feel rather chary about trying this method again, but it appeals to me so strongly, and the arguments in its favor are so great that I am going to see if it is possible to improve my technique if the fault has been mine. I don't think it is possible that my cases have always been the unfortunate cases, the other doctors getting the favorable ones, and if there is anyone who can suggest where I have been faulty in my technique I should be glad to hear from him.

Dr. Homer Dupuy, New Orleans, La.—I have had sufficient experience with the blood-clot method to know its absolute limitations. When we think of the objects to be accomplished by the mastoid operation in acute mastoiditis, namely, the protection to life, and not less important, possibly, the protection of the hearing, we can see, therefore, that there must be but the very smallest number of cases in which the blood-clot can be safely applied. The mastoid antrum is now regarded as the accessory cavity of the middle ear. In sub-acute mastoiditis some cases are operated because, plus other symptoms, they have a free otorrhea. The object of the operation, plus the protection to life, is to drain the middle ear from behind, and we must make sure to keep the antrum open as long as possible, so as to freely drain the middle ear from behind, and thus protect the delicate middle ear's structures from the constant presence of infected secretions. Therefore, the more experience I have with this method the more I limit my cases purely to those in which there is a slight discharge from the middle ear and they are mighty few and to those in which possibly only the antrum is involved. Of course a sinus exposure either pathological or operative would, to my mind, be a contraindication for the blood-clot. It certainly is not a safe proceedure as a routine measure.

Dr. John L. Burgess, Waco, Texas.—My experience in mastoid surgery having been almost wholly private practice, and practically no clinical work, is more or less limited. We who practice in Texas, I don't believe, get the same proportion of mastoids as those of you who are in, especially, the larger cities and have large clinics. I did my first blood-clot operation some twelve years ago, following the operation of Blake, of Boston, and I followed his technique, and in doing this I was particularly careful in choosing the sclerotic mastoid. As you know, the percentage of sclerotic mastoids is very few. I have used it in special cases. I used it in one acute case which was a complete failure. Now, I don't feel that we should condemn when we have not had sufficient experience to develop a perfect technique in this case. As to drainage of a mastoid, if we had a perfect mastoid operation in acute mastoids, we clear and cleanse that cavity. We leave no infected cells or debris from infected parts, and we have a surgically clean cavity. There should be no hasty condemnation of the blood clot, I speak from a scientific point. We judge everything from a surgical point, by results, and I must say that Blake, of Boston, and Wright, of Boston, his principal follower, have certainly got results. I believe it was Dr. Wright who last year showed us and reported a series of cases running into quite a number, hundreds, and he tells me he does his blood-clot operation in practically all mastoids, that is, simple mastoids, regardless of infection, and his results are beautiful, and I feel that it is at least worthy of investigation; and then the rapidity with which they heal, when you are successful, when you can dismiss from the hospital with a closed wound, and practically clean, within seven days after the operation, I think it is at least worthy of consideration. I want to thank Dr. Boyd for hearing his valuable paper.

Dr. Boyd (closes)—I wish to state that the greatest importance in the beginning is to do a complete exenteration of all the diseased parts, as you would in any mastoid operation.

Of the 25 cases that I have mentioned, there is only one that was broken down, and that, of course, was treated as you would an ordinary operation, namely—the open method.

The great point to be gained is the very early recovery, and, to do away with the horrible condition of packing these cases from day to day until they are well. As I stated in my paper, this is only done in selective cases; especially is it performed in acute conditions, found so much among children. I wish to commend it to you.

REASONS FOR OPPOSING THE OPTOMETRY BILL.

[EDITOR'S NOTE—*This letter was the cause of Governor Henderson, of Alabama, vetoing the optometry bill. It so clearly sets forth the dangers of optometry as a profession that we believe that ophthalmologists generally will be interested in reading it and that many will preserve it for reference when similar legislation is sought in other states.*]

MONTGOMERY, ALA., October 2, 1915.

Hon. Chas. Henderson,
Governor of Alabama.

DEAR SIR: Permit me, very briefly, to set forth some of the reasons why the bill purporting to regulate the practice of optometry in Alabama should not become a law.

The Supreme Court of this state has decreed that any person who essayed to correct abnormalities existing in human beings by any method or means whatsoever was, in truth, engaging in the practice of medicine and, consequently, must first measure up to certain prescribed requirements which would make him, at least, not an unsafe man to assume such responsibilities. These requirements are clearly set forth in the laws now in force regulating the practice of medicine.

The special field of work proposed to be covered by the so-called optometrist, who, in reality, is an optician, and an optician has ever been considered a tradesman—is a branch of ophthal-

mology, which, in turn, is a most important field of medicine.

Further, this bill specifically denies opticians the right to use drugs, and justly so; because the careful use of drugs requires a medical education, and the careless use of even one drop of atropin may destroy the sight in a glaucomatous eye. Yet there is complete unanimity of opinion among the trained scientific oculists the world over that vision cannot be accurately determined and defects therein properly remedied until the muscle of accommodation within the eye is first suspended by a drug. Practically all concede that a drug is *necessary* in *every* case where the eyes of children are examined, and all agree that in a majority of instances a drug is needed in the examination of the eyes of adults.

If this be true, then this bill should not become law; because the definition at the outset of the bill precludes the use of drugs. In my opinion, for this state to license men as qualified to examine eyes, when by the very terms of their license they cannot do the work, would result in putting the state itself in the position of being a party to a false pretense. It would be a gross betrayal of trust, on its part, to unloose on an unsuspecting public a horde of half-baked, inexperienced men to care for the abnormalities of the most delicate organ in the body, and yet to withhold from them the use of one of the most essential weapons of their warfare.

Again: Could the human eye be looked upon as an independent physical window, totally disconnected from the various other organs of the body, then one might see some justification for the claims of the adherents of this bill. But is this so? Every thinking person knows that the human body is so delicately attuned; each organ so correlated with the other as that disorders in one part of the system are likely to be reflected throughout the whole, or some other part of, the system. Ask the sufferer from Bright's disease what was the earlier symptom of his trouble. Most often his reply will be: "Trouble with my vision." Ask the sufferer with a beginning brain tumor what were his earlier symptoms. Most often the reply will come: "Trouble with my vision."

Many other examples might be cited; but these will suffice to show that bodily diseases manifested in the eyes need, and must have, early and proper diagnosis for their successful treatment.

The plea, in defense of this bill, is being fatuously made that the rural districts need protection from the itinerant spectacle vendor. There is no more reason for special legislation to prohibit the spectacle peddler than any other class of peddlers. If any restraint must be thrown around the itinerant vendors, it should properly be in the enforcement of existing laws, or else by the enactment of regulations which are not a direct thrust at the educational system of the state.

Another view of this matter demands careful consideration. It is safe to assert that a *commercial* feature is closely interwoven into the threads of this bill. Should the state place its stamp of approval upon it, not alone would it lull the innocent sufferer into a false sense of security by magnifying the importance of the so-called optometrist, but it would enable him to obtain prices for glasses far beyond their intrinsic value.

To say that other states have pased laws similar to the one under consideration—just as they have so passed laws licensing osteopaths, chiropractors, and other cults, which Alabama has not, as yet, done—is no reason why this state should permit to be battered to the ground the high standards of qualification to practice medicine now obtaining in Alabama.

Trusting that you, in your wise judgment, will see that Alabama makes no such mistake, I beg to remain, Very truly yours,

J. N. BAKER,

President Medical Association of the State of Alabama.

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NEW IDEALS IN MEDICINE.

For centuries the Oath of Hippocrates was solemnly read to the young graduates in medicine, and it was accepted by them as their guide in the paths of rectitude throughout their professional lives. The Hippocratic Oath should still be the creed for physicians, but medicine has progressed more than any other profession; and with its advancement have come new responsibilities. There is such great difference now and in the days that have passed in the methods of practicing the art of healing the sick that there is need for adding new ideals. The sentiments, expressed in chaste and beautiful language, on a card received during the holidays from Dr. Stewart Roberts will appeal to every true physician who attempts to practice modern medicine. We offer it as a corollary to the ancient creed of phyiscians.

The beginning of the new year is ordinarily the time for making resolutions, but the beginning of each month, of each week and of each day should offer the occasion to resolve to aim at higher ideals and then to strive each day to live up to them. The earnest, conscientious physician who makes as his resolution the sentiments expressed by Dr. Roberts, and then lives up to them, will achieve greater values during the year 1916 and in the years to come than ever before dreamed of, and his life will be an inspiration to others in the practice of the noblest of professions.

AN IDEAL OF MODERN MEDICINE.

Whenever and wherever my work, by day or night, in peace or war, on land or sea, in laboratory or office, home or hospital, classroom or open field, may I be patient, poised and thorough; loyal to science and to men, unselfish in labor and pure in life. May I hold that science is better than gold and men than greed, that service is proportionate to preparation, and reward to labor. May I use drugs only when indicated, diagnose before I treat or operate, clean before I deliver, use my laboratory, preserve a sense of proportion, respect but not worship my own opinion, seek consultation often, be slow to judgment and cautious in word and deed, and mingle in mind and touch

with medical men. In the laboratory may I keep my records, in clinical cases my histories, and between them and me preserve the accuracy of truth. .May I be strong with the weak, righteous with the wicked, wise with the foolish, honest with myself and kind to all men. May I avoid professional comparisons and sensitiveness, speak well of those of the household of medical faith, shun jealousy and eschew envy, follow progress, beware lest the demands of life chill my enthusiasm for study and knowledge, play sometimes and wander when I may. May I take injustice gracefully, disappointment easily, fight disease cheerfully, death hopefully, believe victory and defeat equally a part of the larger plan, and rise from both fresh for repeated conflicts. May I remember that I am heir to the same diseases as my patients, must meet the same death, pass with them beyond the River, and may I go with a smile.

MEDICINE: A PROFESSION OR A TRADE.

In the *Boston Medical and Surgical Journal* of Nov. 4, 1915, Dr. Hugh Cabot devotes his attention to the question whether medicine is a profession or a trade. After a deserved compliment to the doctors of a past generation and their accuracy of judgment, he goes on to say that "judgments of character have given way to assortments of data, and, whereas a practitioner of a generation ago was profoundly influenced in his decisions by his study of the individual, the consultant of today may almost arrive at his opinion without ever seeing the patient." He thinks the division of medicine into specialties has sounded the death knell of the general practitioner. His place is taken by groups who have some hospital or some eminent individual as a center round which they revolve. The result is to divide and subdivide the profession; to render it less personal and more mechanical; to reduce each individual into a mere cog in a machine, and to greatly magnify the cost of medical and surgical service. This lack of personal relations between patient and physician, the increase in professional expenses and the growing dependence of all but the most eminent upon the good will and recommendation of those much inferior in attainments has resulted in political practices and secret agreements of the most reprehensible character. Such a group so constituted tends to unify the efforts of a coterie to command, through its friends, the medical resources of a neighborhood, regardless of the rights or necessities of those outside the group. Dr. Cabot thinks competition for money is the root of the evil, but it is a root hard to eradicate, for it is based on human necessity, which is said to know no law. Every doctor will make a living if he can, and when he sees a group working together and leaving him out, he is apt to cry "ring!" and proceeds to work for practice in the way that he thinks most likely to succeed.

And thus, before we know it, medicine becomes a trade based upon competition most keen. Dr. Cabot's remedy for this business competition is the paying of salaries to all physicians, salaries paid either by the state or by some institution or hospital. In other words, medical practice must be taken over by the state or by medical institutions.

As he seriously objects to the first of these alternatives, only the second remains. This would seem to imply that hospital treatment should be the rule and not the exception.

It seems to the JOURNAL that the horizon of Dr. Cabot's vision is limited to regions where hospitals abound. Those villages, towns and settlements where such are unknown, where the cross-roads doctor does his own appendectomies and amputations hundreds of miles from hospital groups, are left out of consideration. Yet such regions are numerous in every state, and in some are the rule.

The fact is that our young men have been too dazzled by successful specialists to realize the usefulness and dignity of general practice.

Some day there will be a rule that no physician shall assume the position of specialist until he has demonstrated his worthiness by ten years of successful general prac-

tice and has appeared before a board of the specialty to which he aspires and satisfactorily passed the examination. Then the dignity of medicine in all its branches will be elevated once more from the level of a trade to the high plane of a profession.

"DE SENECTUTE," OR CONCERNING OLD AGE.

Mankind is no longer satisfied with the biblical allottment of three-score years and ten as the natural period of life. Old age has been postponed at least a decade. The "lean and slippered pantaloon" of Shakepeare is transformed into the neatly dressed citizen who shares the enthusiasm of his grandchildren for athletic sports.

Several circumstances help to account for this postponement of senility. When the elderly person is ill he is no longer bled and purged by a Dr. Sangrado, but is dieted and fed and bathed and encouraged, so that instead of succumbing to violent measures his constitution is re-enforced and he takes a fresh start in life. The excessive use of alcohol, the profuse eating of meats and highly spiced dishes and the excitements of the gaming table and the race course, all of which caused a strain on the arterial system tending toward sclerosis, are now the exception instead of the rule. The importance of physiological rest, the value of vegetables and fruits in the diet, and the advocacy by the medical profession of proper exercise and the free use of water internally and externally are all valuable elements in the reform. Even yet the value of rest and relaxation combined with proper exercise free from exertion, for the man or woman past fifty, is not appreciated as it should be. If work must be done during the autumnal years, its hours should be few and interspersed with brief periods of rest, and any "exercise" should be of an opposite character from the labor. The brain worker should read trashy novels and take brief walks. He can accomplish more in the output by doing so and with less wear and tear to himself. The most treacherous element in the conservation of health is the exercise. Too many people confuse it with exertion, and exhaust themselves with walking, horseback riding, rowing or the dumb bells. The fact is that for many aged people sufficient muscular motion to maintain health can be pursued within the home. It is said that a certain widely known U. S. Senator, who was considered down and out for many months, and who now, in spite of his age, is active in his public duties, takes his exercise lying flat on his back before rising in the morning, kicking violently and threshing about with his arms. Anyone who will try the experiment one time will be readily convinced that it is easy to carry this form of exercise to the point of exertion. The food of elderly people cannot be specified in any table of calories. It should be that which experience has taught them best agrees with them. They should, however, eat slowly and masticate thoroughly, and if they have been accustomed to smoking, two or three cigars or pipes a day will do little harm, but it is best not to use tobacco in any form. In this, as in all things, moderation must be the rule. In one thing only can they safely indulge themselves freely, and that is their hours of rest and sleep.

The one matter that is apt to be troublesome is constipation. For this we have two sovereign remedies, apples and olive oil. If these are freely combined with the diet, the constipation generally disappears.

The aged should take life easy, that it may be long and pleasant. But all the time and everywhere they must beware of crowds, for therein lurk those fatal foes, la grippe and pneumonia.

GOVERNOR HENDERSON, OF ALABAMA, VETOES THE OPTOMETRY BILL.

In a number of states the optometrists

have succeeded in securing legislation which most thoughtful medical men, particularly the ophthalmologists, regard as fraught with danger to the public. In Georgia, however, and in Louisiana and in several other states, the opposition to the "optometry bill" led by such men as Dr. H. H. Martin, of Savannah, and Dr. Oscar Dowling, of Louisiana, was strong enough to defeat the measure before the legislatures.

In Alabama the optometrists were able to enlist as their advocates several of the leading physicians in the State, and, surprising to relate, the Medical Association of the State of Alabama endorsed the optometry bill. The optometrists were so well organized, and proved such skillful lobbyists, that their bill passed both branches of the legislature by large majorities, and would have become a law in Alabama had not Dr. J. N. Baker, President of the State Medical Association, had the courage—even though the State Association had endorsed the optometry bill—to urge the Governor to veto it. Dr. Baker presented such strong reasons why the bill should not become a law that Governor Henderson, with characteristic good judgment, vetoed the measure. Dr. Baker's letter to Governor Henderson sets forth so clearly the dangers of the optometry bill that we publish it in this number under the Department of Ophthalmology.

When the optometrists make the effort to secure similar legislation in other states, those interested may perhaps use Dr. Baker's letter with the same effect on the thinking members of the legislatures as it had on Alabama's courageous Governor.

MEDICAL EDUCATION IN CHINA.

Dr. William H. Welch, of Johns Hopkins, who went to China last summer as a representative of the Rockefeller Foundation and a member of the China Medical Board, has recently returned and speaks of several interesting features relating to the teaching of medicine in that ancient empire. Among the drawbacks that interfere with the establishment of medical colleges are the lack of funds to pay for the services of good doctors, who cannot be secured without proper salaries; also the trouble of securing suitable locations. He says the government is not so much a republic as a military despotism. He says the best educational work in China is being done by the missions, and through their efforts medical schools, colleges and other schools have been established. Excellent facilities are offered by some of these institutions, though the government has not rendered the assistance it should.

The Rockefeller Foundation has taken over the Medical College at Peking, and all modern methods have been installed. Dr. Welch went into the interior 800 miles and observed the work of the Yale Mission, of which he speaks very highly. Educators in China are taking very kindly to modern methods of medical education. His conclusion is that it will be impossible at this time to meet the whole needs of China as regards medical schools, but much good can be accomplished by the establishment of two or three first-class schools as examples.

Most of the political unrest is caused by foreign agitators.

FALSE AND FRAUDULENT STATEMENTS IN EXPLOITING PATENT MEDICINES.

The boundaries set by law to limit the extent to which unprincipled manufacturers of worthless drug compounds may pervert the truth for their own profit have finally been permanently fixed by a recent decision of the U. S. Supreme Court. Previously the act forbidding the misbranding of compounds as to their contents had been decided as good law, and misbranding had become too hazardous for manufacturers to take the risk, but so long as the labels and the accompanying circulars stated truly the names of the ingredients of the preparation,

though in terms that not one person in ten could understand, they were at liberty to misrepresent at will the effects of their compounds and could claim records of cures beside which the miracles of the New Testament were mere amateur efforts. Tuberculosis, cancer, epilepsy and a host of other incurable diseases could be promised absolute cures, and often the claims of wonderful results were so impossible as to be absurd, but they deceived many of the laity and brought to their perpetrators a harvest of dollars. So outrageous did the situation become that in 1912 Congress enacted the Sherley amendment, which cured the defect in the previous law. It is now as hazardous to lie about the effects of medicine, if printed upon the labels or in accompanying circulars, as it is to misbrand their contents. A Chicago drug concern has supplied the case whose decision has finally settled all doubts about the force and meaning of the law and established its constitutionality.

The Chicago firm shipped to Omaha a lot of medicine described in accompanying circulars as a compound which had cured and which it knew would cure tuberculosis. The shipment was seized by the government and condemned by the federal district court in Nebraska, and the Supreme Court of the United States has affirmed the action.

In announcing the decision Justice Hughes says: "We find no ground for saying that Congress may not condemn interstate transportation of swindling preparations, accompanied by false and fraudulent statements, as well as lottery tickets."

This is plain speech and a logical position, but the question naturally arises as to whether the condemnation applies to these "false and fraudulent statements" only when they accompany "swindling preparations" or whether they are not by themselves illegal and subject to the penalty of the law. If the two infractions must go together to be unlawful, then the manufacturers can simply send their medicines lawfully labelled as to their contents in one shipment and send the "false and fraudulent statements" at another time and by a different agency, and there you are.

But if it is the statements that are illegal and subject to seizure and condemnation, why should not newspapers in which they so brazenly appear be forbidden the privilege of interstate shipment?

Even, as sometimes happens, when false statements concerning the therapeutic value of drugs appear in medical journals of more or less character, why should they be specially licensed to disseminate a harmful lie?

A MODEL CITY AND COUNTY.

In New Hanover County, North Carolina, the county board of education has provided for every rural school a sanitary toilet, with concrete tanks. In two of the county townships, namely, Cape Fear and Masonboro townships, every home has a toilet. Moreover, the City Council of Wilmington has voted to lend $50,000 for the purpose of changing privies to flush closets. Property owners give their notes at 6 per cent, payable in installments to suit their own convenience. The council also voted $50,000 to improve the water supply and $10,000 for an anti-mosquito campaign. During the year 1904, 1,856 flush closets were installed in the city, and the loan plan is expected to entirely eradicate the privy evil from the sewered district. Twenty years ago what would have been thought of a city official who proposed such expenditures? Today they are deemed praiseworthy and an example to be followed wherever financial conditions will warrant the expenditure, for it means the end of soil pollution, the eradication of hookworm and the victory over typhoid fever.

FRESH AIR.

The one substance with which we are always surrounded and without which we can-

not live an hour, is one of which we are most densely ignorant or thoughtless, is the air we breathe. Seldom do we reflect that only 20 per cent of the atmosphere is oxygen, and 80 per cent is nitrogen, a gas utterly useless in respiration; and that these two gases are not united in a chemical bond but are merely mixed together, like sugar and water, and can be easily separated. The only other element required for comfortable respiration is the vapor of water and the degree to which the air is saturated with it in no respect reduces its healthfulness. The prevailing idea that "damp air" is unwholesome is erroneous, either by night or by day. Likewise the temperature of the atmosphere within normal bounds is not, per se, a factor in its healthfulness. No matter how damp the air may be, if the body is protected against loss of its heat the dampness works no ill, and "night air" is just as wholesome as that of the day. The one great, necessary factor is absolute purity and freshness. The rest matters but little. Patients with bronchitis or pneumonia are too frequently compelled to breathe an atmosphere that has been blistered over plates of hot iron and laden with the vaporous results of repeated respiration of themselves and their companions because they are afraid of the night air.

By such a practice the tissues are made more receptive to the germination and growth of the ever-present germs of the season. Just now the bacilli of "colds," influenza, bronchitis or pneumonia are most to be feared, and it is a powerful defense against them to allow the air, day and night, to circulate freely and unimpeded by human contrivances in every room in the house, under which conditions it will quickly purify itself from accidental contamination. The moisture it contains will be controlled principally by the temperature, and the carbonic acid will not be in excess. So do not let your patients be afraid of cold or damp air, but rather encourage them in breathing it untainted with indoor impurities. If it is cold weather have the patient well wrapped in light but warm bed clothing, but keep the windows open. If necessary several bottles of hot water, but not too hot, and wrapped in towels, can be distributed around the patient to keep him warm and comfortable.

In spite of some authorities to the contrary, it is often wise to provide for breathing air that has been warmed to a comfortable degree. This is especially true of the aged or infirm when attacked by pneumonia, yet the air must be pure. This is accomplished by having the bed placed within four or five feet of the source of artificial heat, and having curtains of some kind suspended from the bedposts on the three sides away from the fire, leaving the bed open to its warmth.

A sheet or some light covering should be spread from post to post at the top and fastened to each of them. The writer has seen severe cases of pneumonia thus provided for in log houses through whose wide cracks the wind came unchecked, while the patient, lying in this improvised "Dutch oven," could defy temperature but a few degrees above zero.

Under such treatment no such fearful records of mortality were dreamed of as now blacken the pages of statistics in some of our most pretentious hospitals. One important precaution must be observed in such cases. No "draft" of air must be allowed to impinge upon the person of the patient, not because of any intrinsic evil in the air, but because the vitality is too weak to resist the abstraction of the normal heat of the body. Among all the therapeutic measures for the prevention or treatment of influenza, bronchitis or pneumonia the proper management of the ventilation and temperature is most impotrant.

It should be attended to in detail by the physician and its importance carefully impressed upon those in charge.

DEXTROSE AND DIABETES.

Dr. Samuel T. Meltzer and Dr. L. B. Kleiner, investigators in the Rockefeller Institute, believe that in dextrose they have found the cause of diabetes. Should their conclusions be sustained by experience their discovery would indeed be a boon to humanity. Government reports available indicate that about nine thousand persons in this country annually succumb to the disease, and as it is very slow in its course and often unrecognized for years, we are justified in believing there are more than twice that many cases in existence. In the cases of youths and young adults the disease is apt to run a rapid course to a fatal end, but instances are not rare wherein aged people sustain the drain for years unconsciously, and finally succumb to some intercurrent affection.

Dextrose is one of the natural products of our metabolism. When an excess is produced it is eliminated through the kidneys and, if the process continues, we have diabetes. Dextrose is also, to a certain extent and from natural sources, a wholesome article of diet, being the sugar found in fruits, while glucose, which is almost identical, is the sugar found in grapes, honey, etc. These are natural foods and wholesome for healthy people. But a way has been found to manufacture them cheaply on a commercial scale by the reaction of a mineral acid upon the starches of grains. Enormous quantities of this artificial sweet are used for the manufacture of the cheaper grades of candies and the fancy syrups seen on our breakfast tables. Many of these syrups are elegant in appearance and palatable to the taste, but there is a sticky, glutinous texture to most of them that betrays their chemical origin. It is to these artificial products that the medical profession will attribute the production of diabetes if the theory prevails.

They should not, however, allow it to prejudice the minds of the people against the sweetness of sweet fruits, nor against that most royal of all sweets, pure honey gathered by the bees from fragrant flowers.

CHENOPODIUM VERSUS THYMOL.

Drs. William A. Bishop and O. T. Brosius, Resident Physicians, Santo Tomas Hospital, Panama City, Ancon, C. Z., have been investigating the comparative merits of thymol and oil or chenopodium for the treatment of uncinariasis. They consider their hospital extremely favorable in climate and situation for the study of parasite therapy. Clinical material is abundant and patients are willing to cooperate with physicians. The authors prefer the chenopodium treatment for the following reasons: The technic of its administration is much simpler than that of thymol and intelligent cooperation of patients and nurses more easily secured. The results following its ingestion are less drastic.

In therapeutic doses chenopodium oil is non-toxic. The treatment with chenopodium can be repeated in three days, if necessary, while five or six days must elapse with thymol.

The number of courses of treatment required for a thorough cure of uncinariasis was smaller under chenopodium treatment than under thymol. The method of administration of the chenopodium oil is simple and attended with little discomfort. It is put up in capsules containing 8 drops, and to adults two capsules are given at a dose for three doses, 2 hours apart. Then four hours later a full dose of castor oil, generally 2 ounces, was administered. It has been recommended that two or thee c.c. of chloroform be added to the castor oil, but our authors did not use it. In the cases of children one drop of the chenopodium oil is allowed for each year of the child's age, repeated twice, two hours apart, followed by castor oil. It is evident that the dose should be somewhat dependent on the weight and de-

velopment of the child, for at 16 years of age some children might find 16 drops a heavy dose. However, that is a simple matter of detail. The fact that chenopodium is non-toxic, easy to administer and a better remedy for uncinariasis than thymol is reason sufficient for its adoption. The cost is about the same. The authors base their conclusions on the clinical results of treating 108 patients with chenopodium oil. Among them were children from 3 to 14 years of age, and in no instance was any ill effect shown from the drug. The subject deserves the careful consideration of the medical profession. This JOURNAL has once before called attention to the subject, but this additional information warrants renewed mention. Their report appears in the A. M. A. Journal, November 6, 1915.

PHENOLPTHALEIN.

In the Lancet, of November 15, 1915, J. C. McWalter, M.D., Examiner in Materia Medica, Apothecaries Hall, London, recites a rather extensive experience with phenolphthalein as a laxative for both children and adults, having records of the administration of over one thousand doses. To adults he gives from 2 to 6 grains, or 1½ grains, two or three times a day until effectual. He finds it very useful in the constipation of pregnancy, but mentions no special dose or time of administration for women in that condition. He prefers it to cascara in the treatment of chronic constipation, as more efficient with less griping. For some reason not specified he condemns its use in tablet form unless mixed with chocolate. For children he prescribes from one-half to three-fourths of a grain. He speaks especially of its usefulness in muco-membranous colitis in doses of half a grain three times a day.

To those of us who have seen the happy result of a teaspoonful of castor oil night and morning in that little understood condition his suggestion sounds reasonable. It should not be forgotten, however, that phenolpthalein has been accused of causing or aggravating albuminuria, and this feature should be watched every day in patients who are taking this attractive drug, especially if there should be any derangement of kidney action.

THE HAFKINE ANTI-PLAGUE SERUM.

At this time, when the attention of the profession is so much occupied with a consideration of the various vaccinations, inoculations and injections of physiologic serums for the specific treatment of diseases, or as prophylactics against them, a brief account of the conclusions reached by one of the most eminent advocates of this form of treatment will not be out of place.

In the July number of the *Journal of Hygiene,* published in London, Dr. W. F. Hafkine discusses the effect of inoculation with his anti-plague serum upon Europeans and upon the natives of India, basing his conclusions on the findings of the Indian Plague Commission. Briefly stated, those conclusions are that in Europeans and natives "the inoculation now in force" reduces the liability to attack to less than one-third of what it was in an uninoculated Indian; that in Indians the immunity conferred lasts "through several outbreaks," that inoculated Europeans very rarely take the disease and those who do so invariably recover; that in the cases that do occur in inoculated Indians the recoveries are double those in the non-inoculated and that inoculation mitigates the attack in those already affected. On the other hand, experiments proved that the serums of Lustig, Terni and Bandi, Brazil, Roux and Yersin were useless as curative agents.

He compares the success of anti-plague inoculation with the vaccinations by Prof. Wright against pneumonia, a procedure found to be absolutely futile. But for the fact that the above statements were abundantly fortified by quotations from the

statistical reports of the Plague Commission, they might be taken with the proverbial grain of salt, but in reality they seem conclusive. Altogether the article is illuminating on a subject of great and growing interest.

SOUTHERN MEDICAL NEWS

ALABAMA.

The Birmingham Infirmary has announced the purchase of one gram and 100 milligrams of radium at a cost of $132,000.

At Birmingham Dr. R. M. Cunningham, City Health Officer, in his report for November, stated that the prevalence of typhoid fever was but half what it was in October. He announced the presence of a mild epidemic of influenza.

At Tuscaloosa, December 15, the Tuscaloosa Medical Society elected the following officers: President, Dr. B. H. Searcy; vice-president, Dr. J. J. Durrett; secretary-treasurer, Dr. Collier.

At Mobile, December 11, the Mobile County Medical Society elected the following officers: President, Dr. D. T. McCall; vice-president, Dr. J. J. Peterson; secretary, Dr. W. W. Scales; treasurer, Dr. Angelo Festorazzi; librarian, Dr. G. J. Winthrop. Dr. M ans Blewett was elected health officer for Citronelle, and Dr. J. H. Dodson physician at Pine Grove Hospital. Dr. J. J. Peterson was elected a member of the committee on public health.

At Greensboro, December 9, the Hale County Medical Society elected the following officers: President, Dr. A. L. Nourse, of Sawyerville; vice-president, Dr. C. K. Smith, of Greensboro.

At Moulton, December 7, the Lawrence County Medical Society elected the following officers: President, Dr. J. H. Irwin; vice-president, Dr. D. C. Walker; secretary-treasurer, Dr. S. R. Sanders; county health officer, Dr. M. R. Taylor.

At Guntersville, December 15, the Marshall County Medical Society elected the following officers: President, Dr. P. B. Lusk; county health officer, Dr. W. A. Elrod, of Albertville; county physician, Dr. J. H. Thomason, of Gunterville. Dr. R. F. Fennell was re-elected city health officer for Guntersville.

Dr. R. M. Cunningham, of Birmingham, has resigned his position as a member of the State Board of Censors in the Medical Association of the State of Alabama. Dr. B. L. Wyman has been appointed to fill the unexpired term of Dr. Cunningham.

Deaths.

At McKenzie, December 24, Dr. M. Nall was slain in a pistol duel with Dr. W. J. Travis, who was also seriously wounded.

Dr. Louis W. Desprez, aged 66 years, a practitioner of Florence, died in Arkansas, whither he had gone to the bedside of a son who was ill.

ARKANSAS.

At Little Rock, December 20, Dr. Morgan Smith, Dean of the Medical Department of the University of Arkansas, tendered his resignation to Governor Hays, who is ex-officio chairman of the Board of Trustees of the University. On January 4, the Penitentiary Commission elected Dr. S. W. Colquit, of Magnolia, to succeed Dr. W. W. Coulter as penitentiary physician.

At McGehee, December 26, Dr. A. G. Hearn resigned as division and examining surgeon of the Iron Mountain Railroad. Dr. W. H. De Clarke, of Little Rock, was appointed his successor.

At Rogers, December 15, the Benton County Medical Society elected the following officers: President, Dr. T. M. Rice, of Avoca; vice-president, Dr. J. T. Clegg, of Siloam Springs; secretary-treasurer, Dr. C. A. Rice, of Rogers.

At Marshall, December 15, Dr. J. E. Knighton, of Shreveport, La., was elected president of the Tri-State Medical Society, and Texarkana, Ark., selected as the 1916 meeting place.

At Hope, December 14, the Hempstead County Medical Society elected the following officers: President, Dr. M. V. Russell; vice-president, Dr. J. S. Waddle; secretary, Dr. G. E. Cannon.

On December 7 the Garland County Hot Springs Medical Society elected the following officers: President, Dr. J. M. Proctor; vice-president, Dr. S. D. Weil; secretary-treasurer, Dr. M. F. Mount.

Deaths.

At Texarkana, December 27, Dr. Christopher C. Burke died at his home, aged 79 years.

On December 20, Dr. D. A. Sims, of Ft. Smith, died in St. Joseph, Mo., while on a business trip. His age was 65 years.

DISTRICT OF COLUMBIA.

In Washington, December 12, sixty ministers spoke from their pulpits in support of health work, with special reference to tuberculosis. The 10th of the month was observed as tuberculosis day in all the public schools. It is designed to make all children familiar with certain fundamental health rules.

Diphtheria has been discovered in the Industrial Home School. On January 3, thirteen cases, twelve of the carrier type and one clinical, were found there. Class work was suspended. The death rate in the city increased during 1915 from 16.59 in the preceding year to 18.15. Deaths from accidents, homicides and suicides were increased, as well as from disease. The death rate from pneumonia increased over 42 per cent. Much of this increase is ascribed to disregard of the ordinance against spitting on floors of street cars.

Surgeon R. L. Wilson has been detailed to New Orleans to study hydrocyanic gas method of fumigating ships.

(Continued on page xxii.)

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(Continued from page 192.)

Deaths.

On December 21, Dr. H. L. E. Johnson, aged 56, died suddenly at his home.

On Sunday, December 26, Dr. W. McK. Goodlove died at his home after a long illness, aged 78. He was a Confederate veteran.

FLORIDA.

At Miami, December 9, Dr. James M. Jackson was re-elected president of the City Board of Health, a position he has held ever since its organization.

At Miami the Board of Health protests against the interference "from the outside" with its work. It objects to the purchase of disinfectants and having them charged to the Board without any member being consulted.

At Tampa the Hillsboro County Anti-Tuberculosis Society has decided to continue its work until the public is thoroughly educated to the necessity of adopting means to stamp out this plague. The schools and the churches will cooperate in the effort.

At Sanford, December 22, the Orange County Medical Society elected the following officers: President, Dr. G. H. Edwards, of Orlando; vice-president, Dr. O. J. Miller, of Sanford; secretary-treasurer, Dr. C. A. Boone, of Orlando.

Dr. Charles W. Bartlett, Assistant State Health Officer, writing to Mayor D. B. McKay, of Tampa, says that where in that city there were 185 cases of typhoid in 1914, during the same period in 1915 there were but 114 cases. He believes that on account of the better system of recording cases during the past year the difference is much greater in reality than the figures show.

At Miami the Board of Health decided, in December last, to have large placards printed warning the public to refrain from spitting on the sidewalks or in public buildings, and notifying them that the penalty is $25 for each offense.

Dr. R. R. Kime has removed from Atlanta, Ga., to Lakeland, and announces his practice limited to surgery and diseases of women.

Dr. G. H. Benton, of Miami, has announced his removal from the Burdine Building to the Toownley Building.

GEORGIA.

At Thomasville, December 12, the Thomas County Medical Society elected the following officers: President, Dr. E. L. Morton, Boston; vice-president, Dr. W. W. Jarrell, Thomasville; secretary, Dr. S. L. Cheshire, Thomasville. The next meeting of the society will be at Pavo on the second Thursday in March.

The Lowndes County Medical Society met at Valdosta, December 15, and elected the following officers: President, Dr. D. W. Freeman; vice-president, Dr. J. M. Smith; secretary-treasurer, Dr. Joe A. Thomas.

At Savannah, December 17, the Georgia Medical Society elected the following officers: President, Dr. Jabez Jones; vice-president, Dr. A. J. Waring; secretary-treasurer, Dr. D. R. Bassett.

At Dublin, December 15, the Laurens County Medical Society elected the following officers for the next six months: President, Dr. R. J. Chappell, of Dudley; vice-president, Dr. J. F. New, of Dexter; secretary-treasurer, Dr. J. H. Moore, of Dublin.

On December 16, the Fulton County Medical Society elected the following officers: President, Dr. W. A. Selman; vice-president, Dr. R. B. Ridley; secretary-treasurer, Dr. Wampole Brewer.

At Milledgeville, December 8, the Baldwin County Medical Society elected the following officers: President, Dr. Lamar Turner; vice-president, Dr. G. I. Garrard; secretary-treasurer, Dr. M. D. Clayton.

At Cartersville, in December, the Bartow County Medical Society elected the following officers; President, Dr. A. T. Calhoun; vice-president, Dr. Tanner Lowry; secretary-treasurer, Dr. R. D. Stone.

At Waycross, December 8, the Ware County Medical Society elected the following officers: President, Dr. P. P. Lane; vice-president, Dr. A. Fleming; secretary, Dr. R. C. Dodson.

At Macon, Dr. Howard J. Williams has resigned from the City Board of Health after having served for twenty years. He is succeeded by Dr. O. H. Weaver.

KENTUCKY.

At Hopkinsville, December 17, it was reported that there were not fewer than 1,000 cases of influenza in the city.

On December 8, the Warren County Medical Society elected the following officers: President, Dr. F. D. Cartwright; first vice-president, Dr. D. B. Stone, of Hydro; second vice-president, Dr. L. M. Weaver, of Allen Springs; secretary-treasurer, Dr. Burnett W. Wright.

At Owensboro, December 21, the Daviess County Medical Society elected the following officers: President, Dr. G. L. Barr, of Owensboro; vice-president, Dr. John Clayton, of West Louisville; secretary, Dr. J. J. Rodman.

At Louisville, December 20, the Jefferson County Medical Society elected the following officers: President, Dr. J. Garland Sherrill; first vice-president, Dr. Bernard J. O'Connor; second vice-president, Dr. Oscar Block; secretary, Dr. E. Owsley Grant; treasurer, Dr. Albro Parsons. The former president, Dr. Ap Morgan Vance, was president-elect of the State Medical Association of Kentucky. He has since died.

At Bardwell, December 11, the Carlisle County Medical Society elected the following officers: President, Dr. T. A. Pease, of Kirbyton; vice-president, Dr. D. S. Robertson, of Cunningham; secretary, Dr. W. L. Mosly, and treasurer, Dr. G. W. Payne, both of Bardwell.

At Paducah, December 22, the McCracken County Medical Society elected the following officers: President, Dr. Allen H. Shemwell; vice-president, Dr. J. B. Acree; secretary, Dr. C. E. Kidd; treasurer, Dr. P. Linn.

At Hopkinsville, the Christian County Medical Society elected the following officers: President, Dr. J. Paul Keith; vice-president, Dr. W. W. Durham; secretary-treasurer, Dr. J. W. Harned.

At Winchester, December 31, the Clark County Medical Society elected the following officers: President, Dr. John A. Snowden; vice-president, Dr. Howard Lyon; secretary-treasurer, Dr. Russel Henry.

(Continued on page xxiv.)

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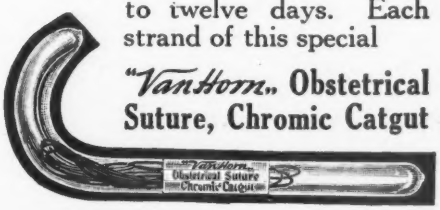

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(Continued from page xxii.)

December 22 it was reported from Carlisle that the schools at Moorefield have again been closed on account of scarlet fever. This is the third time within a year.

At Owensboro, December 22, Dr. W. F. Gillin, an aged physician, was thrown from his buggy and suffered a broken arm and shoulder and inteernal injuries.

On December 16, Dr. W. A. Bolling, of Forrest Court, Crescent Hill, left for Washington to be present at the marriage of his sister, Mrs. Norman Galt, to President Wilson.

At the annual conference of health officers in Louisville, the final call showed that practically all of the 135 officers of the state had been present at one or more of the sessions.

On December 10 Dr. J. W. Barnhill, City Health Officer of Owensboro, announced that the city was free from all cases of epidemic disease.

At Lexington, January 4, Dr. W. O. Bullock was re-elected by acclamation president of the city board of health. A negro physician, Dr. J. K. Polk, was appointed an extra city physician by the board, to work among the negroes of the city.

At Louisville, January 5, the City Health Department determined to increase its efforts to seek the points in community life which are peculiarly sources of grip infection. Health Officer Grant believes the crowded street cars do much to spread the disease and also the moving picture houses. He has asked the street railway company to do what it can to improve the ventilation on the cars and sanitary inspectors will be on them. Persons caught spitting in the car will be liable to arrest and fine. Dr. Grant also warns the public against the use of telephones, and advises that the mouthpieces be frequently washed with alcohol.

From Whitesburg, in Eastern Kentucky, comes the report that la grippe, in the worst form seen for thirty years, is raging in a number of mountain counties and deaths have occurred among elderly people.

On December 31, the State Board of Health acted favorably upon eleven applications for licenses to practice medicine in Kentucky. Secretary McCormack was directed to notify three physicians, one of Louisville and two of Covington, who recently pleaded guilty to violations of the Harrison narcotic act, to appear before the board at its February meeting and show cause, if any, why their licenses to practice medicine in this state should not be revoked.

At Maysville, December 10, twenty-five children appeared at a free clinic for examination. Five of the little boys walked two miles to a bus line to come, while two of the young women saw for the first time a street car and a locomotive. Twelve were found to have tuberculosis and eight had trachoma in various stages. All will receive free care and treatment.

Deaths.

At Benton, December 27, Dr. Marshall A. Stilley, aged 22 years, died at his home of tuberculosis.

At Sulphur, December 9, Dr. C. R. Martin, an aged, retired physician, died at his home from paralysis.

LOUISIANA.

New Orleans Items: On December 10 the Orleans Parish Medical Society elected the following officers: President, Dr. W. H. Knolle; first vice-president, Dr. J. P. O'Kelley; second vice-president, Dr. E. W. Mahler; third vice-president, Dr. M. Thomas Lanaux; secretary, Dr. Charles A. Bahn; treasurer, Dr. Carl A. Weiss; librarian, Dr. Maurice J. Gelpi.

At a meeting of the executive committee of the American Hay Fever Prevention Association, the president. Dr. Scheppegrell, stated that in addition to the seventeen boards of health already co-operating previously reported, seven others have since promised co-operation. Dr. Rupert Blue, surgeon general of the United States Public Health Service, has promised to aid the association in its investigations concerning the pollens that cause hay-fever. At Tulane the threatened epidemic of diphtheria was averted and all danger removed in December. There were eighty-eight carriers of positive diphtheria germs, including several of the faculty, but out of the total of 120 cases quarantined very few developed diphtheria. More than 900 students were examined, but out of the 112 students quarantined all but ten had returned to their studies by December 16. One of the students, a resident of No. 522 Fern Street, violated his quarantine and was reported to the authorities.

At Shreveport, the Shreveport Medical Society elected the following officers: President, Dr. Rawley M. Penick; vice-president, Dr. C. C. Sims; secretary, Dr. Frank B. Walker; treasurer, Dr. I. B. Rougot.

On December 14 Dr. G. C. Chandler, Shreveport City Health Officer, made his monthly report. Scarlet fever was about suppressed. The deaths from pellagra were only one-third the number during the same period during the preceding year.

State Board Items. Dr. Oscar Dowling, president of the State Board of Health, visited Lake Charles January 3 to investigate the epidemic of typhoid fever prevailing there, carrying with him a quantity of anti-typhoid virus. On December 4, thirty-five physicians presented themselves before the State Board for examination in medicine. Of this number, twenty-eight passed successfully and were given certificates. Also six physicians were granted certificates through reciprocity. Six out of eleven applicants at the midwifery examination were successful. The Board placed in the budget the sum of $50,000 for the purpose of establishing a laboratory that shall supply serums of different kinds to the people of the state free of charge. The board announces that it has laid plans for a complete mosquito survey of New Orleans, work on which has already begun.

Deaths.

At Sulphur, January 1, Dr. Arthur C. Gribble, for many years a practitioner in New Orleans, died from pneumonia. His age was 58 years.

MARYLAND.

In Baltimore during the week ending December 18 there were twenty-eight deaths from

(Continued on page xxvi.)

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(Continued from page xxiv.)

pneumonia. A total of 203 deaths from all causes was recorded. During this same week of 1914 there were 176 deaths.

The Baltimore City Medical Society has elected the following officers: President: Dr. C. Hampson Jones; vice-president, Dr. F. H. Baetjer; secretary, Dr. Emil Novak; treasurer, Dr. W. S. Gardner.

At Johns Hopkins Medical School the following changes are announced: Dr. Leonard G. Rowntree, associate professor of medicine, resigns to accept the position of professor of medicine at the University of Minnesota. Dr. Holmes, from the Riverside Hospital, New York, enters upon his duties as first assistant superintendent of the Johns Hopkins Hospital.

At the Medical and Chirurgical Building on the night of December 18, one hundred Boy Scouts and a score of Scout Masters listened to talks on health and the treatment of accidents by Dr. S. J. Fort and Dr. Albert H. Carroll. A demonstration of resuscitating drowning persons was given by W. S. Schee, swiming instructor of the Y. M. C. A.

In Baltimore during the first week in January, forty-two policemen were confined to their homes with grip. In all there were seventy-eight members on sick leave.

Among the 800 members of the Baltimore Fire Department, there was, on January 6, not one case of grip. Compared with the condition of the police department, this is truly remarkable.

Dr. William H. Welch, who went from Hopkins to China last summer as a representative of the Rockefeller Foundation to study the medical schools there, has returned home, arriving at Baltimore January 6.

Dr. William H. Bash, accident physician of Mercy Hospital in Baltimore, has been reappointed. He recently resigned, but was prevailed upon to return to his old place.

Dr. J. R. B. Branch has removed from Baltimore to Changsha, China, where he is connected with the Hunan-Yale Hospital.

MISSISSIPPI.

At Purvis, December 22, the Lamar-Marion-Pearl River Counties Medical Society elected the following officers: President, Dr. E. W. Mackey, Purvis; first vice-president, Dr. L. C. Rouse, Poplarville; second vice-president, Dr. C. C. Thompson, Columbia; third vice-president, Dr. W. B. Thompson, Lumberton; secretary-treasurer, Dr. D. D. Stevenson, Lumberton.

At Newton, December 18, the Newton-Winston-Neshoba Counties Medical Society elected the following officers: President, Dr. J. E. Jarvis, Neshoba; first vice-president, Dr. Thomas Reagan, Beech Springs; second vice-president, Dr. J. S. Laird, Union; secretary-treasurer, Dr. S. A. Majure, Dixon.

At Richton, December 14, the Tri-County Medical Society elected the following officers: President, Dr. R. M. Cochran, Richton; first vice-president, Dr. J. W. Copeland, Richton; second vice-president, Dr. W. R. Graves, Richton; Dr. S. Lewis Knight, of Merrill, was re-elected secretary-treasurer.

At Lucedale, December 28, Dr. Charles E. Ward was elected Mayor for one year.

At Meridian the City Council has elected Dr. T. J. Houston health officer and Dr. F. C. Spaulding assistant health officer.

At Bogue Chitto, the appearance of diphtheria and scarlet fever about the middle of December caused the suspension of the graded school until January 3. Infected homes were placed under strict observation.

Dr. R. N. Whitefield, assistant director of public health with the Mississippi State Board of Health, has been transferred to the Delta to assist in anti-malarial work. He says the decrease in hookworm infection has been nearly fifty per cent, and that one more year's work in Forrest County would practically free it from the disease. The general health condition has improved in every respect.

Dr. W. S. Leathers, director of the public health in Mississippi, has begun a campaign against malaria. Many prominent physicians, including Drs. Bass and Johns, of New Orleans, will be called upon to assist. The sum of $25,000 has been donated by the International Health Commission for the work under the supervision of the State Board of Health. The work will begin in Bolivar County. Reports of 116,000 cases of malaria were reported to the board in 1915.

The State Board of Medical Examiners announce that the date for holding examination of applicants to practice medicine in Mississippi has been changed from June 13-14 to June 20-21.

At a recent meeting of the Holmes County Medical Society, the following officers were elected: Dr. E. C. Lucas, president (re-elected); Dr. J. W. Jordan, vice-president; Dr. G. G. Ash, secretary; Dr. J. W. Bailey, censor.

Dr. B. A. Shepherd was unanimously elected by the Board of Supervisors of Holmes County as visiting physician to the jail and county poorhouse, a position he has served in for twenty-seven years.

Deaths.

At Natchez, December 14, Dr. Hal Metcalfe, a retired physician, died at the home of his brother, Mr. J. M. Metcalfe.

At Lexington, December 29, was held the funeral of Dr. R. K. Jones, of Tchula. Interment was at Odd Fellows Cemetery.

In Jackson, January 4, Dr. J. S. Beavers, a physician of Wesson, died, aged 76 years.

NORTH CAROLINA.

At the annual meeting of the American Medical Editors' Association held at the McAlpine Hotel, New York, the middle of October, Dr. Edward C. Register, editor of the *Charlotte Medical Journal* was elected president.

On December 20, at Asheville, the Buncombe County Medical Society elected the following officers: President, Dr. Charles L. Minor; vice-president, Dr. W. L. Elias; secretary-treasurer, Dr. G. B. Tennent.

Dr. T. M. Jordan, of Alamance County, and Dr. A. C. Bulla, of Northamton, report increased interest on the part of the people in medical school inspection work.

(Continued on page xxviii.)

Treatment and Prophylaxis of Lobar Pneumonia

Recovery from Pneumonia depends chiefly upon the formation of antibodies destructive to the pneumococci and capable of neutralizing their toxic principles.

Antipneumococcic Serum, Polyvalent, Mulford, is the blood serum of horses immunized against different strains of pneumococci that produce corresponding antibodies, and is, therefore, polyvalent. **Used in the early stages of pneumonia** and in sufficient doses, the serum affords valuable aid on account of these contained specific antibodies.

Syringe package of Pneumo-Serobacterin, ready for immediate use. The graduations of the syringe permit convenient administration of divided doses.

Dosage and Administration.—The therapeutic dose should be at least 100 mils. (c.c.), repeated every four to six hours, to secure sufficient antibodies in the patient to overcome infection. Since quick response is desired, intravenous use of the serum is preferred. In a series of cases reported the total amount of serum administered intravenously ranged from 190 to 460 mils. (c.c.); one patient received a total of 700 mils. (c.c.)

Antipneumococcic Serum Mulford (polyvalent) is furnished in aseptic glass syringes containing 20 mils. (c.c.) and in 50 mils. (c.c.) ampuls, with special apparatus for intravenous injection.

Pneumo-Serobacterin Treatment

The value of Pneumo-Serobacterin in the treatment of pneumonia depends upon the polyvalency, the production of antibodies and early administration. It is frequently employed as an adjunct to serum treatment, stimulating the production of greater amounts of antibodies by the patient.

Time is a vital factor in the treatment of pneumonia. The early use of **Pneumo-Serobacterin** is advised; its action is prompt and increased doses may be given at short intervals, securing quicker immunizing response.

Prophylactic Immunization Against Pneumonia

Summarizing a report by Sir Almoth E. Wright on immunization among a large number of African native miners having very low resistance against the pneumococcus, the London Lancet says: "It seems difficult to resist the conclusion that the pneumococcus vaccines employed by these observers lessened the incidence and mortality of pneumonia and other conditions produced by the pneumococcus, and among large collections of natives who were highly susceptible to its activity and under conditions favorable to the spread of infection."

For prophylaxis, Wright suggests doses of 1000 million pneumococci as the first dose, followed by a second dose of 1000 million. It is desirable to immunize persons especially susceptible to the pneumococcus, such as those who suffer from repeated attacks of pneumonia, and particularly aged persons.

Another field in which prophylactic immunization has been extensively employed is when pneumonia threatens as a complication of typhoid, influenza, etc The work of Wright and his collaborators verifies in a conclusive manner the usefulness of this practice.

Pneumo-Serobacterin Mulford is supplied in packages of four graduated syringes, A, B, C, D strength, and in syringes of D strength separately.

H. K. MULFORD CO. Manufacturing and Biological Chemists **Philadelphia, U. S. A.**

New York Chicago St. Louis Atlanta New Orleans Minneapolis Kansas City San Francisco Seattle Toronto

(Continued from page xxvi.)

Dr. P. W. Covington, formerly of Hallsboro, is now with the International Health Commission at Saint Johns, Antigua, British West Indies.

Dr. C. E. Wilkerson, of Randleman, is now at Doleib Hill, Egyptian Sudan, Africa, where he is connected with the American Mission.

OKLAHOMA.

Dr. John Overton, of Tulsa, has accepted appointment as attending surgeon, Phillippine General Hospital, Manila, and has assumed his new duties.

SOUTH CAROLINA.

Dr. E. A. Hines has removed from Anderson to Seneca. Dr. Hines is giving up his hospital work to go back to his old practice at Seneca. With his return to Seneca, the office of the secretary of the State Medical Association is removed to that place.

TENNESSEE.

The Carroll County Medical Society has elected the following officers: President, Dr. J. T. Aydelott; first vice-president, Dr. H. T. Collier; second vice-president, Dr. J. B. Cox; third vice-president, Dr. S. W. Huffman; secretary-treasurer, Dr. B. C. Dodds.

In Selmer, December 27, the McNairy County Medical Society elected the following officers: President, Dr. H. G. Sanders; vice-president, Dr. W. T. Bell; secretary, Dr. J. B. Smith.

At Morristown the Hamblen County Medical Society elected the following officers: President, Dr. J. F. Campbell; vice-president, Dr. H. L. Milligan; secretary, Dr. T. Carroll.

At McMinnville, December 7, the Warren County Medical Association was reorganized, with Dr. T. E. Bales, president, and Dr. E. E. Northcutt, secretary-treasurer. Dr. L. S. Truster, representing the American Medical Association was present.

At Franklin, December 16, the County Medical Society elected the following officers: President, Dr. B. T. Nolen; vice-president, Dr. J. O. Walker, secretary-treasurer, Dr. K. S. Howlett.

The Madison County Medical Society has elected the following officers: President, Dr. Leon Williamson; vice-president, Dr. Fleming J. O'Connor; secretary-treasurer, Dr. W. G. Saunders.

At Chattanooga, City Physician H. Quigg Fletcher has been instructed by Commissioner H. D. Huffaker to start a crusade of vaccination, beginning with the city schools. Commissioner Huffaker intends that there shall not be a case of smallpox in Chattanooga this year.

At Pulaski the Giles County Medical Society has elected the following officers: President, Dr. W. D. Abernathy; vice-president, Dr. J. E. Baugh; secretary, Dr. C. A. Abernathy; treasurer, Dr. E. C. Freeman.

At Memphis, Dr. A. R. Porter, Jr., and Dr. Frank D. Smythe are associated in the practice of medicine, with offices in the Porter Building.

Chattanooga reports that the entire city is in the clutches of La Grippe. One of the large private schools found it advisable to suspend work.

Dr. D. W. Roberts has removed from Little Rock, where he was connected with the State Hospital, to Milwaukee, Wis., where he will be connected with the Sacred Heart Sanatorium.

Deaths.

Monday, December 13, at Johnson City, Dr. George H. Berry, aged 61 years, died after a lingering illness.

At Chattanooga, December 15, Dr. W. F. Moore, aged 59 years, died at a local hospital.

At Cleveland, December 10, Dr. J. N. Hill, aged 62 years, died.

At Greeneville, December 17, Dr. E. B. Smith died at his home, aged 80 years.

At Memphis, December 20, Dr. A. G. Sinclair died of pneumonia, aged 73 years.

At Cleveland, December 10, Dr. P. Watt Cate, aged 61 years.

TEXAS.

At Huntsville, the Walker County Medical Society elected the following officers: President, Dr. Eugene Baylis; vice-president, Dr. A. R. Autrey; secretary, Dr. J. W. Thomason.

The Tom Green Medical Society elected the following officers: President, Dr. G. M. Yates; first vice-president, Dr. J. B. Caffin; second vice-president, Dr. Harlan Horney; secretary, Dr. J. W. Nibling.

The Falls County Medical Society has elected the following officers: President, Dr. F. H. Shaw; vice-president, Dr. W. H. Allen; secretary, Dr. A. J. Streit.

The McLennan County Medical Society has elected the following officers: President, Dr. Doyle Eastland; vice-president, Dr. C. W. Davis; secretary-treasurer, Dr. C. E. Collins.

The Bexar County Medical Society has elected the following officers: President, Dr. F. C. Walsh; vice-president, Dr. P. I. Nixon; secretary, Dr. W. H. Hargis; treasurer, Dr. L. B. Jackson.

The Gonzales County Medical Society elected the following officers: President, Dr. George Holmes; vice-president, Dr. A. B. Parr; secretary-treasurer, Dr. W. P. Dawe.

The Orange County Medical Society has elected the following officers: President, Dr. J. E. Reeves; vice-president, Dr. A. G. Pearce; secretary, Dr. J. P. Hewson.

The Hill County Medical Society has elected the following officers: President, Dr. T. E. Hunt; vice-president, Dr. B. C. Smith; secretary-treasurer, Dr. J. E. Boyd.

The Wichita County Medical Society has elected the following officers: President, Dr. Everett Jones; first vice-president, Dr. W. H. Ogden; second vice-president, Dr. L. P. Amason; secretary, Dr. Q. B. Lee.

The Denton County Medical Society has elected the following officers: President, Dr. Walter G. Kimbrough; vice-president, Dr. Hill Rowe; Dr. Ada Kincaid, the only lady member, was elected secretary-treasurer.

The Southwestern Medical and Surgical Association met at El Paso and elected the following officers: President, Dr. H. G. Shortle, of Albuquerque, N. M.; first vice-president, Dr. W. W. Watkins, Phoenix, Ariz.; second vice-president,

(Continued on page xxx.)

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Puffed Rice 15c
Corn Puffs—Bubbles of Corn Hearts—15c

(Continued from page xxviii.)

Dr. R. E. McBride, Las Cruces, N. M.; secretary-treasurer, Dr. C. F. Braden, of El Paso. El Paso was named as the next meeting place.

At the meeting of the Tri-State Medical Society of Arkansas-Louisiana-Texas, held at Marshall the middle of December, gold medals for the three best papers on research work presented to the society were awarded to Dr. T. E. Wright, Monroe, La.; Dr. H. L. McNeil, Galveston, Texas, and Dr. T. C. Terrell, Fort Worth, Texas. The society voted to renew the offer for the next meeting, which will be held in Texarkana, Ark.-Texas, in December.

Deaths.

On December 13, Dr. P. R. Hengst, of Waco, died at Johns Hopkins Hospital, aged 59 years.

At Paris, December 6, Dr. Gabriel F. Thornhill died from apoplexy while in his automobile. His age was 56 years.

At Leonard, December 11, Dr. O. S. Ewing died at his home, aged 40 years.

At El Paso, January 1, Dr. G. W. Watt, a physician from Chihuahua, died at a local hospital from pneumonia.

VIRGINIA.

The Tri-State Medical Association of Virginia, North and South Carolinas meets in Richmond on the 16th and 17th of February. The following Committee on Entertainment has been appointed: Dr. J. Allison Hodges, Chairman; Drs. J. A. White, A. M. Willis, B. H. Gray, C. R. Robins, R. C. Bryan, L. T. Price, J. G. Nelson, P. V. Anderson, Manfred Call, T. W. Murrell and W. F. Mercer. Entertainments for the members, as well as the ladies, will be provided, so as not to conflict with the scientific sessions. A large attendance is expected.

The Seaboard Medical Association, of Virginia and North Carolina, has elected the following officers: President, Dr. David T. Tayloe, of Washington, N. C.; first vice-president, Dr. Kirkland Ruffin, of Norfolk; second vice-president, Dr. J. P. Ruffin, Powellsville, N. C.; third vice-president, Dr. R. L. Williams, of Norfolk; fourth vice-president, Dr. William E. Yarren, Williamston, N. C.; secretary, Dr. Clarence Porter Jones, of Newport News; treasurer, Dr. George A. Caton, Newbern, N. C. Washington, N. C., was selected as the next meeting place.

On December 14 the Richmond Academy of Medicine and Surgery elected the following officers: President, Dr. W. L. Peple; first vice-president, Dr. St. Julian Oppenheimer; second vice-president, Dr. O. F. Blankenship; third vice-president, Dr. Ramon D. Garcin; secretary, Dr. Mark W. Peyser; assistant secretary, Dr. E. H. Terrell; treasurer, Dr. J. H. Smith; librarian, Dr. G. P. LaRoque.

Dr. C. C. Hudson, health officer of Richmond, reports that the mortality of 1915 was reduced from that of 1914 by the number of 33. The deaths from tuberculosis were fewer than have ever before been recorded in the city. There was only one death from malaria in the city during the past year, and not one in 1913. In 1907 thirty-two deaths from malaria were reported.

In Richmond the discovery that diphtheria germs were found in the skin sores of school children directed prophylaxis so that the disease has been practically stamped out in that city. The number of negroes infected with tuberculosis is causing serious apprehension. The state will be asked for an appropriation of $40,000 for a sanatorium for negro consumptives. The contributions of the schools during tuberculosis week amounted to $2,192.25.

Dr. B. C. Keister has leased his sanatorium at Roanoke and after doing some special work in New York will locate at Savannah, Ga.

Deaths.

At Charlottesville, December 21, the funeral of Dr. F. E. Bell, aged 30 years, was held from Lyle's Church.

On December 26 Dr. G. T. Collins, of Highland Springs, died at Richmond from the results of an auto accident. His age was 57 years.

WEST VIRGINIA.

At Fairmount the Marion County Medical Society elected the following officers: President, Dr. C. L. Holland; secretary, Dr. H. R. Johnson; treasurer, Dr. W. H. Sands.

At Wheeling the Eastern Panhandle Medical Society elected the following officers: President, Dr. J. M. Miller, of Charlestown; secretary-treasurer, Dr. A. B. Eagle, of Martinsburg.

At Wheeling, up to December 20, the sale of Red Cross seals amounted to $880. If the amount can be brought up to one thousand dollars, a tuberculosis nurse will be employed. In the Richland district Dr. W. S. Webb, of Warwood, has been appointed county physician.

At Martinsburg, December 8, the health authorities lifted the quarantine which, for four weeks, had prevented school children from attending moving picture shows, Sunday schools and other public gatherings on account of diphtheria.

From Princeton, December 20, it was reported that fifteen cases of smallpox were in the vicinity of Roseville, near Bluestone Junction.

Dr. E. J. F. McCleary has moved from Nashville, Tenn., to Wheeling.

Deaths.

At Fairmont, January 5, Dr. Hal Hall, aged 43 years, died at his home from a malignant carbuncle on the neck.

At Fairmont, January 5, Dr. A. J. Flowers died at his home, aged 59 years.

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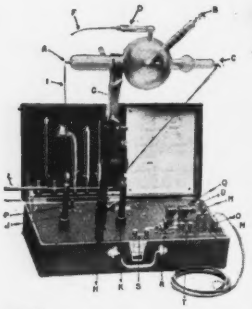

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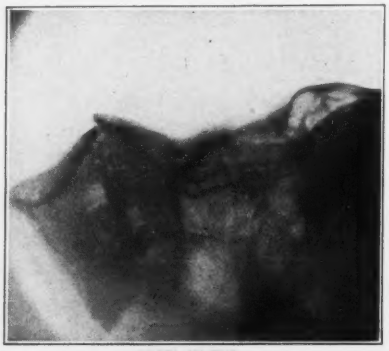

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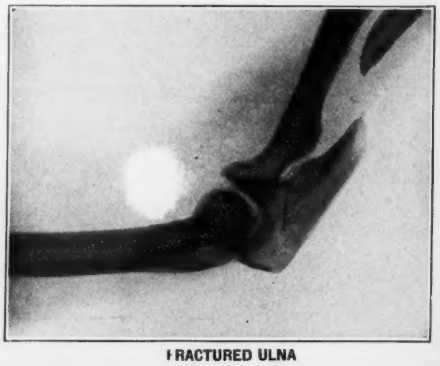

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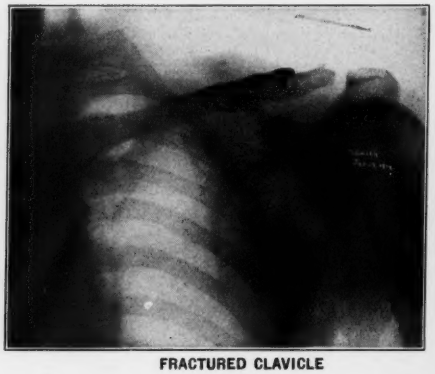

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is a problem that is coming before the physician more and more as one of the most important phases of preventive medicine.

The management of an infant's diet is not a difficult task—it simply means a supply of food elements that are necessary to sustain life and promote growth and a knowledge of some method of adjusting these elements to the individual condition.

The Mellin's Food Method of Milk Modification

meets the requirements in a scientific manner and offers the physician an opportunity to readily acquire a satisfactory solution of the problem.

Communicate with the

MELLIN'S FOOD COMPANY, BOSTON, MASS.

Agar

(JAPANESE JELATIN, DERIVED FROM SEAWEED)

An admirable agent for the treatment of chronic constipation.

AGAR has the natural property of absorbing water readily, and of retaining it.

It resists the action of intestinal bacteria as well as that of the enzymes.

Its chief use in medicine is in the treatment of chronic constipation.

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Agar is not digested.

It passes practically unaltered into the intestine, merging with the feces, adding to their bulk and keeping them uniformly moist.

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Agar has no systemic action.

It serves as a mechanical stimulant to the bowels.

It aids in the production of normal, healthy evacuation, a condition approximating the natural function.

Agar is supplied in 4-ounce and 16-ounce cartons.

One or two heaping tablespoonfuls (according to individual requirements) may be taken morning or evening, at mealtime, with milk or cream or mixed with a cereal food.

Germicidal Soap

(McCLINTOCK)

A powerful and useful antiseptic, disinfectant and deodorant.

GERMICIDAL SOAP (McClintock) is prepared from pure vegetable oils combined with mercuric iodide, the most powerful germicide known.

It is a valuable antiseptic, deodorant and lubricant for hands and instruments.

It is an admirable general disinfectant.

It can be used to prepare antiseptic solutions without measuring, weighing or waste.

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Germicidal Soap (McClintock) is useful for cleansing minor wounds, as a deodorant in offensive hyperidrosis, for the preparation of vaginal douches—in fact, whenever and wherever a powerful detergent and disinfectant is required.

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Germicidal Soap (McClintock) does not attack nickeled or steel instruments. It does not coagulate albumin.

Germicidal Soap, 2%: large cakes, one in a carton.
Germicidal Soap, Mild, 1%: large cakes, one in a carton; small cakes, five in a carton.
Germicidal Soap, Soft, 1%: collapsible tubes.
Germicidal Soap, Surgical, 1%: cylindrical sticks, each in a nickel-plated case.

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Detroit, Michigan.

Parke, Davis & Co.

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